JAMAICA

ANNUAL REPORT

OF THE

Medical Department

FOR THE

YEAR ENDED 31ST DECEMBER, 1933.

Ordered by His Excellency the Governor to be Printed.

JAMAICA.
GOVERNMENT PRINTING OFFICE, KINGSTON.

1934.

CONTENTS.

MEDICAL DEPARTMENT.

Report for the year ended 31st December, 1933.

I.—ADMINISTRATION.

(a) Establishment, including principal appointments, new appointments, transfers, etc.—

Medical Staff.

1 Superintending Medical Officer.
1 Senior Sanitary Medical Officer.
1 Medical Superintendent, Public Hospital, Kingston.
6 Resident Medical Officers, Public Hospital, Kingston.
4 Supernumerary Medical Officers.
1 Dental Surgeon, Public Hospital, Kingston (part time).
1 Radiologist, Public Hospital, Kingston (part time).
1 Government Bacteriologist and Pathologist.
1 Medical Superintendent, Lunatic Asylum.
4 Assistant Medical Officers, Lunatic Asylum.
1 Visiting Surgeon, Jubilee Maternity Hospital.
42 District Medical Officers.
2 Port Health Officers.
12 Health Officers (Central Government).
6 Health Officers (Parochial Board Officials).
1 Medical Officer, Malaria Commission.
2 Medical Officers, Hookworm Commission.
2 Medical Officers, Yaws Commission.
1 Surgeon, St. Catherine District Prison (part-time Prison Official).

Nursing Staff.

1 Matron, Public Hospital, Kingston.
1 Assistant Matron, Public Hospital, Kingston.
1 Matron, Jubilee Maternity Hospital, Kingston.
1 Assistant Matron, Jubilee Maternity Hospital, Kingston.
1 Matron, Lunatic Asylum.
1 Assistant Matron, Lunatic Asylum.
1 Matron, Lepers' Home.
19 Matrons in Public General Hospitals.
13 Nursing Sisters, Public Hospital, Kingston.
107 Probationers and Nurses, Public Hospital, Kingston.
4 Nursing Sisters, Jubilee Maternity Hospital.
15 Pupil Nurses, Jubilee Maternity Hospital.
214 Nurses and Probationers, Public General Hospitals.
88 Female Nurses, Lunatic Asylum.
102 Male Attendants, Lunatic Asylum.
5 District Nurses, Lock-up Dispensaries.

Subordinate Medical and Sanitary Staff.

1 Dispenser, Public Hospital, Kingston.
2 Assistant Dispeners, Public Hospital, Kingston.
17 Dispensers in Public General Hospitals.
1 Dispenser, Lunatic Asylum.
1 Superintendent and Dispenser, Lepers' Home
3 Supernumerary Dispensers.
1 Superintendent, Quarantine Station.
4 Laboratory Assistants.
2 Laboratory Washers and Cleaners.
1 Warden Public Hospital, Kingston.
1 X-Ray Assistant, Public Hospital, Kingston.
1 Housekeeper, Nurses' Home, Public Hospital, Kingston.
3 Chaplains (part-time officials)—Public Hospital, Kingston, Lunatic Asylum and Lepers' Home.
2 Overseers of Works, Hookworm Commission.
26 Assistants Hookworm Commission.
1 Technician, Malaria Commission.
7 Sanitary Inspectors, Malaria Commission.
Other Sanitary Inspectors (Parochial Board Officials)

In addition to the above, there are cooks, washers, foreman, labourers, porters, storemen, watchmen, mechanics, carpenters, dispensary caretakers, etc., etc.

Clerical Staff.

Head Office—
1 Chief Clerk.
1 First Class Clerk and Chief Accountant.
1 Medical Storekeeper (also Secretary, Quarantine Board).
1 Second Class Clerk.
5 Assistants.
1 Assistant, Public Hospital, Kingston.
2 Assistant Storekeepers.
1 Typist and Stenographer.

Lunatic Asylum—
1 Chief Clerk.
1 Second Class Clerk.
1 Assistant.
1 Typist and Stenographer.

Bureau of Health Education (International Health Board of Rockefeller Foundation.)

1 Medical Director (representative of the Foundation in Jamaica).
2 Medical Directors, Tuberculosis Commission.
2 Medical Directors, Yaws Commission.
1 Medical Entomologist.
1 Sanitary Engineer.
1 Secretary.
1 Clerk.
2 Medical Officers, Tuberculosis Survey and Clinic.
1 Medical Officer, Yaws Commission (additional).
Technicians and Field Assistants.

New Appointments.

Major T. J. Hallinan, C.B.E., Superintending Medical Officer.
Dr. L. M. Watson, Medical Officer of Health.
Dr. H. D. Chambers, Medical Officer, Hookworm Commission.
Dr. A. A. Peat, Medical Officer, Yaws Commission.
Miss M S. Lewis, Matron Jubilee Maternity Hospital.
Dr. I. O. B. Shirley, Dr. C. G. Binns, Dr. H. M. Embden, Dr. V. R. Rob } Supernumerary Medical Officers.
Dr. I. S. Lloyd, District Medical Officer, (acting)
Dr. K. R. L. Evans, Government Bacteriologist and Pathologist.

Promotions.

Dr. J. M. Hall, from Medical Officer of Health, Trelawny, to Senior Sanitary Medical Officer, *vice* Dr. J. A. Henderson, transferred to British Guiana.

TRANSFERS.

Dr. H. E. T. McDonald, from Supernumerary Medical Officer to District Medical Officer (part time).
Dr. M. S. Golding, from Supernumerary Medical Officer, to 6th Resident Medical Officer, Public Hospital.
Dr. L. E. Arnold, from Medical Officer, Hookworm Commission, to Medical Officer, Yaws Commission.

RESIGNATIONS.

Dr. T. A. P. Wynter, District Medical Officer.
Dr. T. M. Bartlett, Acting District Medical Officer.

RETIREMENTS.

Dr. A. W. Thomson, District Medical Officer.
Dr. A. A. Myers, Acting Medical Officer of Health.

DEATHS.

Dr. R. M. Atkinson, District Medical Officer.

IN ADDITION.

Dr. H. M. Johnston, Medical Officer Yaws Commission, was awarded a Fellowship in Public Health by the Rockefeller Foundation in the U.S.A. for one year.

(b) Financial—
Expenditure—

	£	s.	d.
Medical—General Administration:			
Personal Emoluments	41,337	4	5
Other Charges	16,791	10	10
Medical—Hospitals and Lepers' Home:			
Personal Emoluments	33,437	15	9
Other Charges	45,862	16	8
Lunatic Asylum:			
Personal Emoluments	21,731	7	3
Other Charges	18,991	3	10
Total Expenditure ..	£178,151	18	9
Total Expenditure of Whole Colony	£2,134,213	6	9
Percentage of Expenditure on Medical Department	8.3%		
Revenue from Fees, etc. ..	£7,563	12s.	0d.

II.—PUBLIC HEALTH AND GENERAL REMARKS.

The severe weather conditions of 1933 with the accompanying serious floods and storm damage to crops were responsible in the latter months of the year for severe outbreaks of Malaria in many districts and a general increase of malaria throughout the Island owing to the continuous rains creating marshy and flooded areas favourable for mosquito breeding in districts which are normally free from mosquitoes. The Malaria epidemics were more severe in the western part of the Island where hurricane damage to houses and crops, with resultant lack of food and adequate shelter, had so reduced conditions of living for the local inhabitants that they were less resistant to attack. The Central Board of Health arranged the free distribution of quinine in all areas where the disease was reported as epidemic. Details of the Malaria work are given later in the reports of the Senior Sanitary Medical Officer and the Malaria Commission.

There was no special prevalence of other diseases during the year.

ORGANISATION OF THE MEDICAL SERVICE.

Enquiry has been made during the course of the year to ascertain the relative work of the whole-time and the part-time District Medical Officer, and in October the Superintending Medical Officer submitted a Report to the Governor on the relative merits of the two systems. On the evidence presented, the Superintending Medical Officer was of opinion that many part-time District Medical Officers were doing as much work as the whole-time officers, that part-time officers generally could be relied upon to perform their government duties equally well with whole-time officers, that the hours of duty and the duties of the two classes of officers were exactly the same, and that the only difference between the two systems was that the whole-time District Medical Officers received a higher rate of pay and were prohibited from private practice, which was actually a disadvantage to the public in their districts. Under these circumstances he recommended that the abolition of the whole-time system of District Medical Officers should be considered. Recommendations were also made in this Report that it would be desirable to place all District Medical Officers on the same rate of pay and conditions of service. At the end of the year under report, these matters were awaiting consideration of the Legislative Council.

Public Health Work.

The Public Health organization of the Island is now in a period of transition. In recent years the Rockefeller Foundation has given considerable and most valuable assistance in the institution of public health measures. Its policy has been to carry out at its own expense a research into a particular health problem, for example, Malaria, and having completed a thorough investigation, to invite the Government to share the expenses of a Unit or Commission to deal with the problem in certain districts to demonsrate that the measures proposed on the basis of the results of the investigation are suitable for effective practical application. At the conclusion of the period of trial over one or two years, the work is taken over entirely by the Government for inclusion in its permanent health measures.

During 1933 the Government took over the entire charge and maintenance of the Malaria Commission and the Hookworm Units, which had been established by the Foundation, and, at the close of the year, the Foundation ceased further contributions to School Dental Clinics which had been established in most parishes and which in future will be maintained by the Parochial Boards with the assistance of grants from the Government. The Tuberculosis Dispensary which had been established in Kingston in connection with the Tuberculosis Commission of the Foundation will be taken over entirely by the Government early in 1934.

The very wide scope of the work that has been carried on in co-operation between the Rockefeller Foundation and the Jamaica Government will be found in detail in Appendices I to XII of this report.

In July 1933 we had the pleasure to receive a visit from Dr. F. F. Russell and Dr. E. L. Opie of the Rockefeller Foundation who came to inspect the work that was being carried on by its various Units and to discuss with the Government its progress and plans for future co-operation. Particular attention was given to the work of the Tuberculosis Commission which, after three years investigation in various districts of the Island, has achieved very valuable results. The investigations are still proceeding on various scientific aspects of the disease in Jamaica but sufficient information had been obtained for the Rockefeller Foundation to present a report and recommendations by Dr. E. L. Opie on measures that should be taken to cope with the Tuberculosis problem in Jamaica. Dr. Opie's Report will be found in Appendix VII.

A scheme to put these measures into effect was drawn up by the Superintending Medical Officer but the misfortunes of the year have delayed the possibilities of its inception on the scale that was originally hoped for.

Housing.

Attention was drawn in the previous report for 1932 to the necessity for further improvement in the housing of the wage-earning population.

The question has received added importance this year by the work of the Tuberculosis Commission which has gathered statistics that show a very definite relation between bad housing conditions and overcrowding with a high incidence of Tuberculosis. There is little doubt that housing is the most important factor in the problem of Tuberculosis in Jamaica and, that though considerable improvement may be effected by improved methods of treatment and increased hospital facilities a permanent and satisfactory reduction cannot be effected until the population is generally better housed and under a higher standard of sanitation and conditions of life that are impossible in small overcrowded houses and in slum areas.

Central Laboratory.

This question was raised in the Legislative Council for the provision by the Government of more adequate facilities for bacteriological and chemical examinations for public health purposes. A scheme for a Central Laboratory was accordingly prepared, but after consideration it was decided that after the severe hurricane and flood disasters of the year, the straitened financial circumstances of the Island would necessitate its postponement.

It was realised, however, that the Government Laboratory was in need of enlargement to meet the great increase of routine work that had developed in recent years, and the proposal was accepted to provide in the new Development Loan for the transfer of the Government Laboratory from its present unsatisfactory quarters in the Kingston Public Hospital to the building housing the Island Medical Office where ample accommodation existed, not only for its immediate requirements, but also for future development. The new building will also house the technical staff of the Malaria Commission. Arrangements are being made to further strengthen the Laboratory Staff by the transfer of Dr. L. E. Arnold of the Yaws Commission to assist the Government Bacteriologist. The new quarters for the Government Laboratory should be ready for occupation in August of next year and, with the accommodation available for extension, the difficulties in the way of acceptance of the Central Laboratory scheme should be considerably lessened.

Nursing Profession.

Attention has been given this year to improving the prospects of employment of nurses trained in Jamaica. The nursing profession had become overcrowded and, though the prospects of employment were few, there were large numbers of applicants for training at the various hospitals. The condition was so bad that numbers of certificated nurses were content to remain in Government Hospitals for some years at the rates of pay of probationers or ward attendants hoping for an ultimate chance of a vacancy in the nurses cadre, sooner than trusting to the very small livelihood that they could hope to gain from private nursing. General trained nurses have to undergo a severe course at least three years' training in Government Hospitals and have to pass three yearly examinations to obtain their certificates. Their prospects then are very seriously handicapped by competition with the trained midwives who have only one year's training to undergo to obtain their certificates and who are accepted by the general public not only as midwives but as fully trained nurses. A preliminary attempt has been made this year to cope with this problem by giving preference to candidates for training in midwifery at the Jubilee Hospital to those who possess certificates of general nursing training. As a result, practically all midwives now under training have general nurses' certificates, and, it is anticipated that this condition will obtain in future, and that ultimately most midwives in the Island will also have a general training, with considerable benefit to the standard of nursing throughout the Island.

General Diseases.

Diseases of the Respiratory System.—There was a marked increase in the morbidity and mortality from respiratory disease. 1,638 in-patients were treated in the hospitals with 322 deaths as compared with 1,224 cases and 222 deaths in 1932.

Diabetes.—77 cases were treated in the hospitals with 20 deaths.

Diseases of the Nervous System.—566 cases were treated with 77 deaths.

Diseases of the Eye.—There were 193 cases admitted in the Kingston Public Hospital and 228 cases in the District Hospitals.

Diseases of the Circulatory System.—719 cases were treated as in-patients in the hospitals with 135 deaths as compared with 584 cases and 132 deaths in 1932.

Diseases of the Digestive System.—This group showed an increase over 1932, there being 3,322 cases with 396 deaths as compared with 2,765 cases and 238 deaths in 1932.

Diseases of the Genito-Urinary System (Non Venereal).—The number treated as in-patients was 3,166 with 172 deaths.

External Causes.—There were 684 admissions to the Kingston Public Hospital with 43 deaths and 2,978 to the District Hospitals with 82 deaths.

Malignant Disease.—There were 253 admissions with 37 deaths as compared with 263 and 45 deaths in 1932.

Communicable Diseases.

These are dealt with in detail by the Senior Sanitary Medical Officer in the following Section on Sanitation.

The high incidence of Enteric Fevers calls for special comment. The incidence of Enteric Fever in any community is usually a good index of the efficacy of its sanitary measures. 1,092 cases of Enteric Fevers were notified in 1933, an increase of 163 over the previous year. 221 cases were notified in Kingston. These figures are high and indicate that however marked the improvement of sanitation in recent years there is great necessity for further improvement. The high incidence of the disease in certain towns is due to overcrowding in slum areas where the bucket system of disposal of excreta is still in use. This was clearly shown in the epidemic this year in Port Antonio where 38% of the cases occurred in 214 houses using the bucket system as compared with 22% of cases in 372 houses with the pit system of conservancy.

Incidence of Enteric Fevers is not high in the country districts except in the parish of Trelawny where pollution of streams in the back districts which are used along their course for water supplies appears to be taking place.

T. J. Hallinan,
Superintending Medical Officer.

III.—SANITATION.

1. Administration.

(a) *Personnel.*—On the promotion of Dr. J. A. Henderson to the post of Surgeon-General British Guiana, the vacant post of Senior Sanitary Medical Officer was filled by Dr. J. M. Hall on 7th June, 1933.

Dr. H. M. Johnston proceeded to Harvard University on Fellowship granted by the Rockefeller Foundation and his post in the Yaws Commission was filled by Dr. J. I. Rerrie.

Dr. L. M. Watson completed his period of study on his Fellowship and obtained the Certificate in Public Health of Harvard University. On his return he was appointed as Medical Officer of Health, Hanover, in place of Dr. A. A. Myers who was acting.

The attendances of members of the Central Board of Health at its 11 meetings were:—

Dr. J. A. Henderson, Acting Chairman ..	4
Major T. J. Hallinan, C.B.E., Chairman ..	6
Hon. Dr. Lawson Gifford	11
Mr. J. M. Nethersole	8
Mr. N. Roots	8
Dr. D. J. Phillips	10
Dr. S. Lockett	1
Mr. P. M. Cooper (Acting for Mr. N. Roots on leave)	2

The Senior Sanitary Medical Officer was present on 10 occasions.

1. *Parochial Staff.*—Table I shews the staff employed by the Local Boards of Health.

Table I.

Parish.	Health Officers.		Sanitary Inspectors.				Nurses	Clerks.	Dental Surgeon.	Others
	Wholetime.	Part-time.	Chief.	Whole-time.	Part-time.	Specially for latrine construction.	Part-time.	Whole-time.	Part-time.	
Kingston ..	1	..	1 (1)	14 (9)	..	..	2	2	1	2
St. Andrew ..	1	..	1 (1)	13 (6)	1	..	5	1	1	..
St. Thomas ..	..	1	1 (1)	4 (3)	1	..	5	..	..	..
Portland ..	1	..	..	1 (1)	3 (2)	..	2	1	1	2
St. Mary ..	1	..	1 (1)	7 (5)	..	..	5	1	1	..
St. Ann ..	..	4	..	8 (6)	1	3	1	..	..	..
Trelawny ..	1	..	..	4 (3)	..	..	3	1	1	..
St. James ..	1	..	..	6 (4)	..	1	4	..	..	..
Hanover ..	1	..	..	2 (2)	5 (1)	..	3	..	..	1
Westmoreland ..	..	2	1 (1)	1	5	4 (2)	6	..	..	10
St. Elizabeth ..	1	..	..	4 (4)	..	..	3	..	..	..
Manchester ..	..	1	1 (1)	4 (2)	..	..	7	..		..
Clarendon ..	1	..	1 (1)	6 (2)	..	5	6	..	1	..
St. Catherine ..	1	..	1 (1)	7 (5)	3 (1)	..	3	..	1	2
Port Royal ..	..	1	..	..	1	..	..	..	..	..

Note.—The Corporate Area employs 1 Oculist and 1 Veterinary Surgeon. The figures in brackets shew the number of persons who hold a certificate from the Sanitary Inspectors' School or from the Royal Sanitary Institute.

2. *Staff of Central Board of Health.*—Table II shews the staff employed in the Commission organised with the co-operation of the Rockefeller Foundation.

Table II.

	Medical Officers.	Overseers of Works.	Clerks.	Microscopists and Technicians.	Field Officers.	Nurses.
Hookworm ..	2	2	6	4	16 (11)	
Malaria	1	..	..	2	7 (5)	
Tuberculosis† ..	2	..	..	*2	..	2
Yaws ..	‡3	..	4	4	10	

Note.—This Table does not include 5 Specialists provided by the Rockefeller Foundation to direct and assist in the work of the Yaws and Tuberculosis Commissions.

† Provided by the Rockefeller Foundation.

* Also do Clerical work.

‡ 1 paid by the Rockefeller Foundation.

The number in brackets shew the number of persons who hold a certificate from the Sanitary Inspectors' School or from the Royal Sanitary Institute.

3. *School Dental Clinics.*—The following parishes operated School Dental Clinics during the year: Kingston, St. Andrew, Portland, St. Mary, Trelawny, St. James, Hanover, Clarendon and St. Catherine.

The Rockefeller Foundation contributed to those in Portland, St. James and Hanover, and have now ceased contributions to School Dental services. The Clinics provided 41,703 treatments to 19,678 children in 1933 as compared with 39,359 treatments to 14,988 children in 1932.

Detailed reports of the Commissions and School Dental Clinics are to be found in Appendices I, II, V, VII, VIII, X and XI.

(b) *Finance*—Table III. shews the expenditure of the various parishes for Public Health.

TABLE III.

	Kingston.	St. Andrew.	St. Thomas.	Portland.	St. Mary.	St. Ann.	Trelawny.	St. James.	Hanover.	Westmoreland.	St. Elizabeth.	Manchester.	Clarendon.	St. Catherine.	Pt. Royal.	
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
1. Aministration—	*	*	*	*	*		*	*	*		*	*		*		
H. O. Salaries ..	800	800	300	706	654	480	605	654	608	400	600	400	744	782	600	..
T. A. ..	150	150	100	150	200	280	200	100	100	..	150	100	150	200	..	..
S. I. Salaries ..	3,254	1,841	800	470	1,144	961	600	782	141	765	380	559	800	936	52	..
T. A. ..	481	310	..	44	260	145	158	168	45	50	95	166	150	364	..	..
Clerks ..	207	140	..	108	150	..	120	78	..	..	..	..	..	120	..	..
Messengers ..			..	20	26	..	18	..	..	..	2	4	39	21	..	..
Total 1 ..	4,892	3,241	1,200	1,498	2,434	1,866	1,701	1,782	894	1,215	1,227	1,229	1,883	2,423	652	..
2. Cleansing ..	13,539	5,955	493	843	2,025	829	292	1,248	210	503	266	302	326	1,425	71	..
3. I. D. Prevention ..	1,776	828	10	95	94	328	32	298	139	17	29	85	414	167	5	..
4. Cemeteries ..	2,012	134	22	173	228	109	7	..	30	42	10	55	15	129	10	..
5. Child Welfare ..	699	131	150	60	170	20	60	308	120	295	49	400	190	493	..	..
6. Conservancy† ..	..	..	..	45	150	..	42	..	109	55	23	55	6	..	166	..
7. Drainage† ..	..	..	145	462	247	215	20	276		41	64	..	..	108	17	..
8. Water Supply ..	485	84	2,933	566	235	894	1,441	94	185	2,212	63	232	..	931	59	..
9. Miscellaneous ..	342	110	23	120	278	231	23	151	57	..	7	228	100	218	..	..
Total 2 ..	18,853	7,242	3,776	2,364	3,427	2,626	1,917	2,375	850	3,165	511	1,357	1,051	3,471	328	..
Grand Total ..	23,745	10,483	4,976	3,862	5,861	4,492	3,618	4,157	1,744	4,380	1,738	2,586	2,934	5,894	980	£81,450

* Salaries and Travelling Allowances of Medical Officers of Health paid by Central Government. † Included under 2. Cleansing.

The Central Government spent the following anounts on matters affecting the Public Health:—

Central Board of Health Expenses ..	£10,611 15 0
Quarantine Expenses	930 14 3
Hookworm Campaign	7,199 9 9
Venereal Disease	431 1 9
Yaws	2,012 10 4
Vaccination Fees	1,317 18 10
Infectious Disease Control ..	328 12 8
Child Welfare Association ..	1,000 0 0
Malaria Commission	3,788 5 1
Bureau of Health Education ..	115 4 9
School Dental Clinics	480 8 9
Training School for Sanitary Inspectors	41 10 3
	£28,257 11 5

The Rockefeller Foundation spent £10,912 15s. 10d. as follows:—

Central Office		£990 7 3
Tuberculosis—X-Ray Laboratory ..	£3,539 12 4	
Clinic	2,045 4 2	
Mobile Unit ..	645 0 1	6,229 16 7
Trelawny Health Department		111 15 2
St. Catherine Health Department		154 8 6
Malaria Commission		175 0 0
School Dental Clinic, Portland		96 7 8
Do. do. St. James		96 17 2
Do. do. Hanover		97 0 0
Yaws Commission		2,961 3 6
		£10,912 15 10

This does not include the salaries of the Director for Jamaica and five other Specialists on the local staff of the Foundation.

(c) *Legal.*—The following Law affecting Public Health was enacted in 1933:—

No. 33—A Law to make provision for the establishment of a Water and Sewerage Board for the Corporate Area of Kingston and St. Andrew.

The following is a list of Notices in the Jamaica Gazette affecting Public Health:—

No. 676. Black River—Rescinding of Section 11 of the Bye-Laws regulating erection, alteration or repair of Buildings within the limits of the town of.

No. 274. Clarendon—Regulation with respect to the handling of bread, cakes, etc.

No. 678. Corporate Area of Kingston and St. Andrew—Amendment to Regulations for the Licensing of shops for the sale of fresh meat, etc.

No. 332. Corporate Area of Kingston and St. Andrew—Regulation with regard to the production and sale of milk and milk products.

No. 700. Mandeville—Regulations for the general management, regulation and control of the Public Cemetery in the town of.

No. 698. Mandeville—Public Cemetery—Resolution defining limits of.

No. 699. Mandeville—Burials discontinued within the limits of the town of.

No. 788. Portland—Amendment to Bye-Law No. 55 (n) of the Bye-Laws regulating proceedings of Parochial Board of.

No. 903. St. Mary—Bye-Laws (as altered) for the order, government and use of the Oracabessa Water Supply.

No. 790. Trelawny—Bye-Laws governing Ulster Spring Water Supply in the parish of.

No. 792. Trelawny—Bye-Laws governing Stewart Town Water Supply in the parish of.

No. 565. Ewarton Water Supply District—altering limits of.

No. 60. Linstead Water Supply District—Altering limits of.

No. 445. Market Rules, St. Ann.

No. 733. Milk Regulations with regard to standard of Milk intended for sale.

No. 368. Public Tanks at Sherwood Forrest, All Spice Grove and Castle in the Parish of Portland—free distribution of water from.

No. 113. Port Morant Water Supply District—altering limits of.

No. 228. Port Morant Water Supply—water rates.

No. 273. Stewart Town Water Supply—water rates.

No. 59. Pedro River Market—closing of, sanctioned.

No. 808. Shop Assistants' (Hours) Law 1925—provisions of, extended to Port Antonio.

No. 789. Reservoir Sawyers, Trelawny—Rules for the management of.

No. 623. Allen's or Founder's Spring, Trelawny—declared to contribute to a Public Water Supply.

No. 229. River Head Spring, Wemyss Road or York Spring, Spring-Gut Spring, Vaughansfield Spring, Banana Spring, Doctor Spring and the Spring at Flamstead known as McCook Spring in the parish of St. James—declared to contribute to Public Water Supplies.

No. 854. Drummond Spring, Blackness, Clarendon,—declared to contribute to a Public Water. Supply.

No. 23. Dry Gully Spring at Darley, Portland—declared to contribute to a Public Water Supply.

No. 328. Grandy Spring, Cascade, Hanover—declared to contribute to a Public Water Supply.

No. 83. John Spring (portion of) at Good Hope, No. 2 Division of Portland—declared to contribute to a Public Water Supply.
No. 785. Mountain River, St. Catherine—portion of water to be diverted and taken for purposes of a Public Water Supply.
No. 428. Ewarton Market—closing of.
No. 61. Black River—limits of for all purposes, viz., Markets, Water Rates, etc.
No. 330. Cemeteries (Strangers Burial Ground on West Queen Street and Spanish Town Road) abandoned.
No. 697. Cemetery, Mandeville—parcel of land acquired for purposes of.
No. 583. Tanks and Reservoirs Westmoreland—Rule for the management of.
No. 122. Annotto Bay District—Local Rate enforceable for sanitary purposes within limits of.
No. 123. Port Maria District—Local Rate enforceable for sanitary purposes within the limits of.

2. Vital Statistics.

Population.—The Registrar General states "The estimated population of the Island on 31st December, 1933 was 1,090,269—males 530,541 and females 559,728. This is arrived at by adding to the estimated population at 31st December, 1932 the number of births registered and the number of persons who arrived in the Island during the year ended 31st December, 1933, and deducting therefrom the number of deaths registered and the number of persons who left the Island during the same period."

The distribution by parishes is shewn in Table IV below.

Births.—35,668 births were registered during the year—18,173 boys and 17,495 girls, the birth rate being 32.9 per 1,000 population as compared with 32.2 in the preceding year.

71.64 were illegitimate.

Deaths.—Table IV shews population, total deaths and deaths by certain causes for each parish.

TABLE IV.

Parish.	Mean Estimated Population 30.6.33.	Pulmonary Tuberculosis.	Typhoid.	Malaria & Black water.	Fever Undefined.	Diarrhoea and Enteritis.	Chronic Nephritis.	Cancer.	Infantile Convulsions.	Congenital Debility.	Apoplexy.	Pneumonia.	Old Age.	Other Causes.	Total.
Kingston ..	73,354	136	71	26	40	164	87	59	19	148	49	228	136	1,008	2,171
Pt. Royal ..	1,081	..	..	..	..	1	..	..	..	..	..	1	..	2	4
St. Andrew ..	60,051	267	6	13	122	134	26	32	103	190	47	54	177	740	1,911
St. Thomas ..	49,261	49	11	63	175	31	59	7	137	49	12	48	63	409	1,113
Portland ..	58,366	59	7	26	173	15	53	15	49	112	15	28	91	392	1,035
St. Mary ..	85,848	97	20	51	222	42	60	33	99	148	28	43	121	588	1,552
St. Ann ..	89,221	88	9	15	157	37	44	19	131	96	21	35	158	555	1,365
Trelawny ..	41,828	40	11	36	135	47	17	12	106	82	8	13	59	330	896
St. James ..	50,946	44	23	31	212	40	64	15	131	72	13	25	68	417	1,155
Hanover ..	47,002	33	5	31	86	49	51	12	118	63	5	13	75	343	884
Westmoreland ..	83,647	53	17	41	251	41	50	28	142	160	14	40	134	586	1,557
St. Elizabeth ..	98,366	88	5	46	251	30	39	10	331	133	25	25	163	642	1,788
Manchester ..	79,649	67	8	4	122	45	37	22	92	125	34	38	150	637	1,381
Clarendon ..	103,261	54	15	34	478	44	41	19	145	147	21	61	66	774	1,899
St. Catherine ..	114,289	116	15	96	400	65	64	29	197	195	19	75	115	872	2,258
Island's gain by excess Arrivals over Departures from last Census day to 30th June ..	45,684	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	1,081,854	1,191	223	513	2,824	785	692	312	1,800	1,720	311	727	1,576	8,295	20,969
Medical and Coroners' Certificates ..	..	823	222	456	18	516	429	259	28	141	206	655	191	3,856	7,800

The Island death rate rose from 17.2 per 1,000 population in 1932 to 19.3 in 1933. The rise in the death rate is largely accounted for by increases in deaths from undefined fevers and acute respiratory diseases and the mortality among the persons over 65 years is observed to be markedly increased. The increase shewn in Table V accounted for about one-half of the total increase.

Table V.

Causes.	Deaths, 1932.	Deaths, 1933.	Increase.
Fever Undefined	2,317	2,824	507
Respiratory Diseases	912	1,267	355
Old Age	1,279	1,576	297
All other causes	13,757	15,302	1,545
Total ..	18,265	20,969	2,704

The largest single group of deaths falls, as usual, under the Heading "Fever, not otherwise defined," but since only 0.6% of the persons whose deaths are placed in this group were seen by Physicians during their terminal illness, the group really represents an assortment of ill-defined causes in which Fever may or may not be the leading symptom, and the information elicited by Registrars is so meagre that deaths are place in this group as a last resort. The Medical Officer of Health, St. Catherine, states as follows: "35 deaths from 'Fever and Cold' were investigated among 73 occurring between the ages of 15 an 80 years. The average duration of the symptoms in these age groups was 7 months which suggests that the majority of these are deaths from Pulmonary Tuberculosis, a result upheld by local enquiry in 21 of the 35 cases." As regards the cause "Fever" alone, he states "there were 227 deaths ascribed to 'Fever.' Enquiry after death may reveal anything, even a denial of fever." His analysis of the records of these deaths shews that the 227 deaths were well distributed over all ages, the largest number occurred in the age group under 5 years with an average duration of illness of 2–3 weeks, the group between 15 and 40 gave a history of 1–4 months illness and that Pulmonary Tuberculosis is probably not an important cause in the group recorded as 'fever' only.

Table VI. shews the deaths by parishes and quarters for the year 1933. The corresponding death rates for 1932 are shewn for comparison.

Table VI.

Parish.	March.	June.	September.	December.	Death rates, 1933.	Death rates, 1932.
Kingston ..	544	585	567	475	29.5	24.8
Port Royal ..	1	1	2	..	3.7	5.6
St. Andrew ..	456	493	480	482	31.8	26.3
St. Thomas ..	287	250	280	296	22.5	19.2
Portland ..	294	248	270	223	17.7	17.2
St. Mary ..	448	397	341	366	18.0	17.1
St. Ann ..	345	333	316	371	15.2	15.1
Trelawny ..	213	223	225	235	21.4	16.9
St. James ..	324	269	293	269	22.6	21.9
Hanover ..	230	217	231	206	18.8	19.2
Westmoreland ..	388	386	371	412	18.6	17.2
St. Elizabeth ..	457	384	398	549	18.1	15.8
Manchester ..	327	351	321	382	17.3	13.6
Clarendon ..	503	444	407	545	18.3	15.8
St. Catherine ..	599	574	542	543	19.1	16.7
Total ..	5,416	5,155	5,044	5,354	19.3	17.2

The sharp rises in the last quarter in Westmoreland and St. Elizabeth coincide with the storm period and are due to a combination of Malaria, Influenza and privation following the continuous rainstorms.

Infant Mortality.—The Island death rates under 1 year and under 5 years were respectively 149 and 214 per 1,000 live births as compared with 141 and 200 in 1932. The infant death rate of Kingston was 137.

The infant death rate is still among the highest in the West Indies and a little more than twice that of England and Wales for 1932 (65 per 1,000 births).

Parish Records of Deaths.—The Health Officers of Kingston, St. Mary, Trelawny and St. Catherine keep duplicate records of each death recorded in their parishes and these are the only parishes which have submitted a statistical report on mortality with appropriate discussions. The Health Officers in the other parishes are unable to make any observations supported by data as to causes of deaths and the factors influencing them.

Mortality from Communicable Diseases.—The information available to the Central Board of Health in this respect is somewhat unsatisfactory, one reason being that although notification of deaths from Notifiable Infectious Diseases is required by Law, some practitioners are neglectful in complying with this requirement unless reminded by the Health Officers to do so. However, with the steady progress being made by Health Departments in location and follow-up of cases there has been considerable improvement.

3. Communicable and Infectious Diseases.

Table VII shews the notification of cases of Infectious Diseases for the year, by months and by parishes.

Table VII.

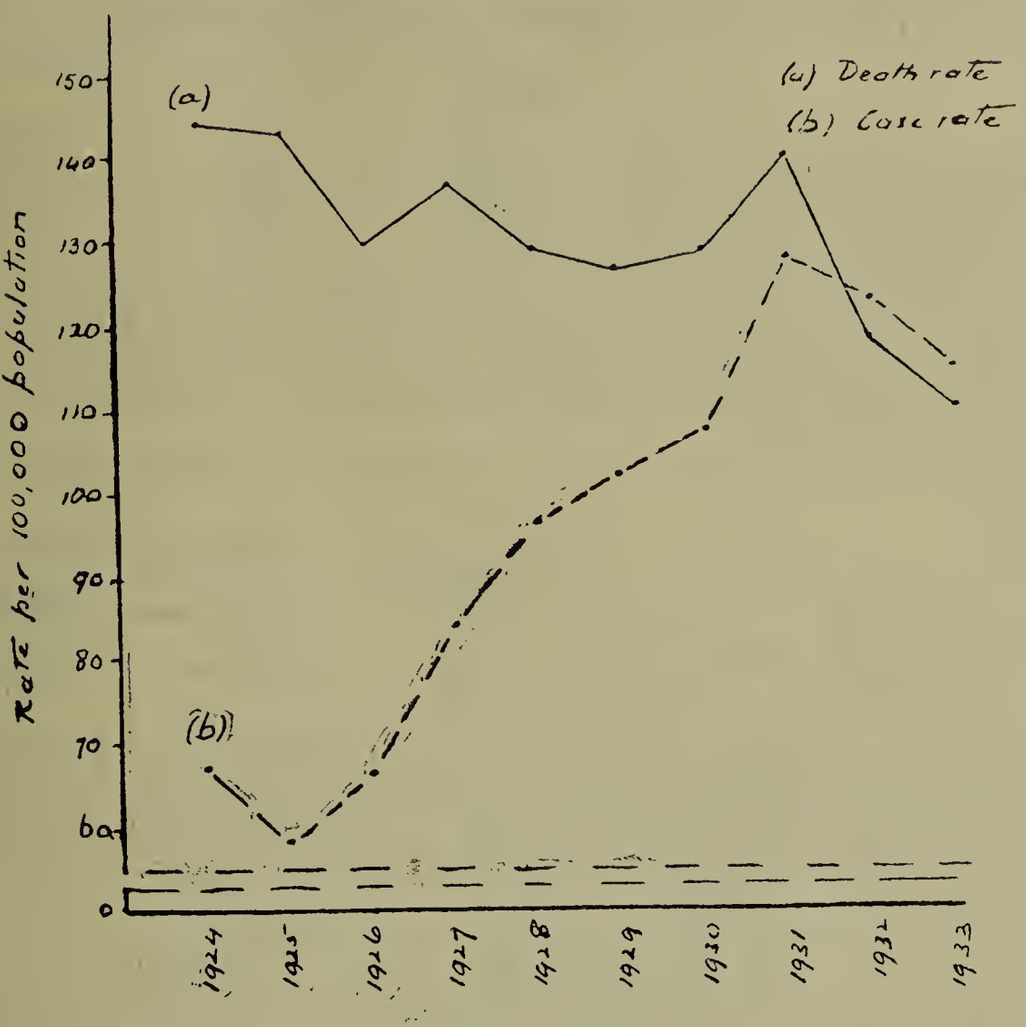
	Typhoid.	Para Typhoid.	Dysentery.	Pulmonary Tuberculosis.	Leprosy.	Chicken Pox.	Diphtheria.	Scarlet Fever.	Erysipelas.	Cerebro-Spinal Meningitis.	Poliomyelitis.	Encephalitis Lethargica.	Puerperal Fever.	Total.
By Months—														
January	71	..	4	99	2	9	2	1	2	2	..	..	4	196
February	51	..	9	105	2	6	1	1	1	2	..	..	5	183
March	78	..	14	121	4	26	4	..	2	..	..	..	4	253
April ..	78	..	39	105	1	25	..	..	2	1	..	..	5	256
May	105	..	34	130	1	56	1	..	2	1	..	..	8	338
June	90	..	21	104	2	6	4	2	1	1	..	..	1	232
July	124	1	26	111	1	7	5	1	..	..	..	..	7	283
August ..	113	..	16	94	1	12	2	..	2	1	..	1	2	244
September ..	102	1	19	92	6	9	2	..	2	3	2	..	2	240
October	82	..	21	81	3	16	..	..	..	..	1	..	2	206
November ..	88	..	28	113	1	18	2	..	3	..	..	2	1	256
December	108	..	18	86	2	23	6	1	1	..	2	..	5	252
Total ..	1,090	2	249	1,241	26	213	29	6	18	11	5	3	46	2,939
By Parishes—														
Kingston	221	..	106	359	4	25	9	2	1	5	2	..	2	736
St. Andrew	164	1	48	140	..	32	13	1	1	2	2	..	2	406
St. Thomas ..	44	..	3	35	..	..	..	..	..	..	..	..	1	83
Portland	63	..	4	76	..	13	1	..	..	..	1	..	..	158
St. Mary	49	..	8	102	..	24	..	1	1	1	..	..	6	192
St. Ann	41	..	7	99	1	53	..	..	1	1	..	..	3	206
Trelawny	100	..	1	44	12	3	..	..	..	..	..	..	1	161
St. James	89	..	6	77	..	29	1	1	2	..	..	..	6	211
Hanover	12	..	18	24	1	9	2	..	1	..	..	3	8	78
Westmoreland ..	35	..	5	29	..	10	3	..	2	..	..	..	1	85
St. Elizabeth	34	1	..	32	..	1	..	1	..	2	..	..	2	73
Manchester ..	49	..	9	30	..	7	..	..	5	..	..	..	3	103
Clarendon	147	..	27	80	2	4	..	..	4	..	..	..	8	272
St. Catherine ..	42	..	4	112	6	3	..	..	..	..	..	..	3	170
Pt. Royal ..	..	..	2	1	..	..	..	..	..	..	..	..	..	3
From Ship board ..	..	..	1	1	..	..	..	..	..	..	..	..	..	2
Total ..	1,090	2	249	1,241	26	213	29	6	18	11	5	3	46	2,939

Pulmonary Tuberculosis.—1,241 cases and 1,191 deaths were recorded as compared with 1,307 cases and 1,456 deaths in 1932. The case rates and death rates per 100,000 population annually since 1924 are shewn in Table VIII.

Table VIII.—Pulmonary Tuberculosis.

Year.	Estimated Mean Population 30th June.	Deaths.	Death rate per 100,000 population.	Cases.	Case rate per 100,000 population.
1924 ..	899,670	1,295	143.9	603	67.0
1925 ..	910,197	1,301	142.9	522	57.4
1926 ..	929,526	1,206	129.7	619	66.6
1927 ..	946,154	1,295	136.9	797	84.2
1928 ..	965,873	1,245	128.9	933	96.6
1929 ..	985,471	1,245	126.3	1,007	102.2
1930 ..	1,008,614	1,297	128.6	1,082	107.3
1931 ..	1,038,921	1,456	140.1	1,327	127.7
1932 ..	1,061,105	1,252	118.0	1,307	123.2
1933 ..	1,081,854	1,191	110.1	1,241	114.8

Rates are based on the mean population estimated by the Registrar General each year and are shewn graphically below:—



The recorded death rate shews a continuous decline and the actual number of deaths recorded each year is declining.

One of the difficulties in considering this recorded death rate is the poorness of medical certification of deaths. Table VIIIA shews the percentage of total deaths attributed to Pulmonary Tuberculosis which are medically certified each year.

Table VIIIA.

Year.	Deaths recorded from Pulmonary Tuberculosis.	Number certified.	Per cent. certified.
1927 ...	1,295	506	39.1
1928 ..	1,245	523	42.0
1929 ..	1,245	528	42.4
1930 ..	1,297	568	43.8
1931 ...	1,456	722	49.6
1932 ..	1,252	735	58.7
1933 ...	1,191	823	69.1

Steady improvement is being obtained, however, in this respect each year due to the better follow-up work on reported cases.

The Tuberculosis Commission with its Kingston Dispensary was established in 1928, the Anti-Tuberculosis League in 1927 and full-time Health Officer's service in 1930. The combined effect of these activities on case finding is indicated by the marked increase in the case rates since 1927. The value of dispensary service with field activities of Nurses and Sanitary Inspectors is illustrated in Table IX.

Table IX.—Cases of 1933 arranged by certain groups of Parishes.

	Population 31st December, 1933.	Pulmonary Tuberculosis	
		Cases.	Deaths.
Kingston ..	73,354	359	136
* 6 parishes with dispensary service	430,926	441	423
† 6 parishes without dispensary service	470,758	299	365

In the 6 parishes where the Health Officers have established dispenary service, Sanitary Inspectors are used to carry out the field work of home visits to notified cases and location of new cases. These parishes also have Local Branches of the Anti-Tuberculosis League in which the Health Officers take an active interest and which are rendering valuable assistance in home care and supervision of cases.

In the other group there is not at present systematic follow-up visits and records on reported cases and their families, and only two of them have a branch of the League but the Government's plan is to urge similar activities throughout the Island.

Table X. shews the cases in the Corporate Area of Kingston and St. Andrew as compared with the rest of the Island.

Table X.

	Mean Population in 1933.	Pulmonary Tuberculosis.	
		Cases.	Deaths.
Kingston and St. Andrew Corporation	133,405	499	403
Rest of the Island ..	1,007,419	742	788

This Table shews that the Corporate Area should be given first consideration in the provision of beds for active treatment and segregation. The observations of Health Officers outside of Kingston shew that from 20 to 30 per cent. of the primary cases found in rural families acquire the disease in the Corporate Area and particularly in Kingston where they go in search of work. When such cases are no longer able to support themselves they frequently return to their families and produce secondary cases. Kingston, and other towns to a lesser degree, must be regarded as foci of the disease, where bad housing, overcrowding and poor economic conditions favour its spread.

The demand for Laboratory assistance in diagnosis continued to increase during the year. The Kingston Dispensary carried out 3,496 X-Ray examinations. A total of 4,050 sputum examinations were done by the Government Laboratory, the Kingston Dispensary and Parochial Health Officers.

The studies of the Tuberculosis Commission since 1928 have led to the formulation of a definite policy for control which is outlined and discussed in the form of a memorandum by Dr. Eugene L. Opie. This is reprinted in Appendix VII.

Enteric Fevers.—1,092 cases of Typhoid Fever were recorded in 1933 as compared with 929 in 1932. In all the parishes except St. Catherine, St. Ann, Hanover and Manchester there were sharp fluctuations from the 1932 records as shewn in Table XI.

Table XI.—Enteric Fevers.

Parish.	Cases 1932.	Cases 1933.	Increase for 1933.	Decrease for 1933.
Kingston ..	124	221	97	
St. Andrew	53	165	112	
Portland ..	45	63	18	
Trelawny	20	100	80	
Clarendon ..	53	147	94	
St. Thomas ..	87	44	..	43
St. James ..	117	89	..	28
Westmoreland	80	35	..	45
St. Elizabeth	70	35	..	35

In the Corporate area although the recorded cases increased from 177 to 386, the deaths shewed only a small increase from 66 to 77 and as there was very little indication of epidemic conditions at any particular period of the year the increase would indicate better reporting due to increased activities of the Health Authorities. On the other hand the very great increase of malaria in the lowland parts of the area from August to the end of the year caused considerable difficulty in diagnosis, and the unusually high number of cases notified in the last quarter of the year must be partly attributed to this.

The Medical Officer of Health St. Andrew called attention to the large proportion of cases reported in the neighbourhood of Halfway Tree.

In Portland 51 of the 63 cases were provided by an epidemic in Port Antonio referred to later.

In Trelawny the great increase recorded occurred in Upper Trelawny distributed over the whole year although the deaths for the parish in 1933 were 11 as compared with 8 in 1932.

* St. Mary, Portland, St. Catherine, Trelawny, St. James and Manchester.
† St. Thomas, St. Ann, Hanover, Westmoreland, St. Elizabeth and Clarendon.

Extensive investigations by the Health Officer throughout the year in the field and in records of deaths among the younger age groups lead him to conclude that the increase is mainly apparent and due to better case finding and notification.

In Clarendon the cases increased from 53 to 147 yet the deaths increased from 12 to only 15, but no explanations are suggested by the Medical Officer of Health.

In St. James 33 of the 89 cases reported were from Montego Bay alone.

There has been a marked increase in the number of blood specimens submitted for the Widal test. The Government Bacteriologist has shewn that the percentage of healthy persons with a strongly positive Widal is quite high and there is need for submitting more bloods for culture of B. Typhosus to increase the accuracy of diagnosis.

The Port Antonio Epidemic.

An epidemic of Typhoid occurred in the town of Port Antonio with 51 cases distributed over the months of June, July and August, the slow development of which in the fly-season suggested fly-borne infection. Four different methods of excreta disposal are in use in the town and the relationship of the infected homes to the methods of disposal is shewn in the following Table.

Table XII.

Method of Disposal.	Total No. of Homes provided.	No. of Cases.	Cases per 100 Homes.
1. Bucket latrines ..	214	19	8.8
2. Over-the-sea latines	22	2	9.1
3. Pit latrines ..	372	13	3.5
4. Water Carriage System	64	2	3.1

The group of homes provided with bucket latrines showed a case incidence of more than twice that in the homes provided with pit latrines.

The small group 2 were located mainly adjacent to homes provided with buckets and showed a similar infection fate. House to house inspection showed that the bucket system was very insanitary and that it would be exceedingly difficult to make it safe with the funds available.

The Local Board of Health is causing bucket latrines to be gradually replaced by water carriage or pit type latrines.

Dysentery.—249 cases were notified in 1933 as compared with 64 in 1932 and 58 in 1931. Of the cases for the year 1933 Amoebic Dysentery accounted for 136, Bacillary for 50 and 63 were unclassified.

There has been a marked increase in the number of faecal specimens submitted to the Laboratory.

Malaria.—The latter half of the year was marked by a very great increase of malaria due to the high rainfall from June to December, the parishes most serously affected being Kingston and St. Andrew, St. Elizabeth, Westmoreland, St. James, parts of Manchester and to a lesser extent St. Thomas. The ordinary altitude limits of endemic Marlaria in Jamaica is 500 feet, but during 1933 the disease extended to areas up to an elevation of 1,000 feet and higher in St. Elizabeth and Manchester.

In the Corporate Area there was a sharp increase mainly in the districts to the west of Kingston, Greenwich Farm suffering particularly, and to a lesser degree the areas to the east.

The western end of the Island shewed the most disturbing increase and it was not possible to prevent an increase even in the control of areas of Sav.-la-Mar, Black River and Montego Bay. The increase in Montego Bay, occurring during the tourist season, called for special activity in order to preserve the reputation of the town as a health resort.

427 cases were admitted to the Kingston Public Hospital in 1933 as compared with 230 in 1932. The country hospitals shewed an increase of in-patients from 2,043 to 4,536 and of out-patients from 5,496 to 10,083.

In spite of this approximate 100% increase of treatment, the total deaths recorded from malaria for the Island decreased from 536 in 1932 to 507 in 1933. Two factors are mainly responsible for this low mortality in 1933:—

(a) The excessive rainfall of 1931 produced epidemic malaria with high mortality in certain areas, notably lower Trelawny, where the disease in normal seasons is of low endemicity, with extensions into adjacent areas. 1932 was also a year of unusually heavy rainfall with a maintenance of malaria far beyond the limits of the areas mapped out in the survey of 1928. The excessive rains of the latter half of 1933 merely activitated malaria which was subsiding during the drought of early 1933, and it is fortunate that 1933 was preceded by two years of unusual rainfall with consequent establishment of a useful degree of immunity in larger sections of the lowland areas.

(b) In addition to this, in the 1931 aestivo-autumnal epidemics the malignant tertian parasite predominated, whereas in the winter outbreak of 1933, the simple tertian parasite relatively increased greatly.

The increased facilities for free treatment at hospitals and the distribution of Quinine by Medical Officers of Health to 4,000 patients was also of great value in controlling mortality.

Control Measures.—Continuous rainfall seriously interfered with preparation and use of larvicides, Paris Green having been hitherto the chief method in use in the areas controlled by the Malaria Commission. Ditching was therefore undertaken to a greater extent and satisfactory results were obtained particularly in Golden Grove, Sav.-la-Mar and Little London.

The freshening and extension of coastal swamps near towns such as Kingston, Montego Bay and Falmouth demand consideration of tidal ditches as being the cheapest method of control.

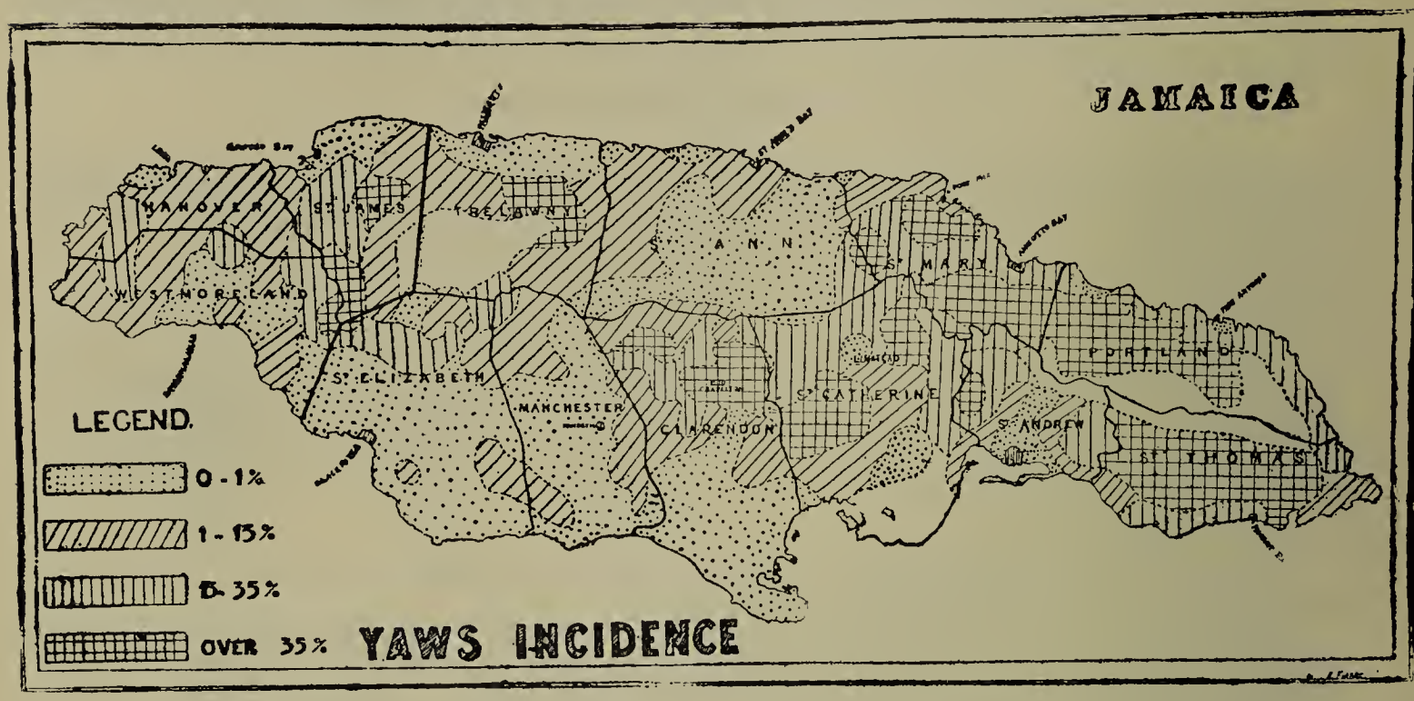
The Medical Officer of Health Portland is obtaining valuable results in Buff Bay and Hope Bay where the owners of property have been required under the Public Health Law to provide and maintain the necessary ditches, and the experience gained in the use of this method is being turned to good account wherever possible.

Local Boards of Health with malaria problems are being urged to assume more responsibility for control work.

The Report of the Malaria Officer is given in Appendix XI under Malaria Commission.

Hookworm Disease.—The reports of the Hookworm Commission will be found in Appendix X.

Yaws.—Investigations of the Yaws Commission place the status of yaws infection at the commencement of the Campaign in 1932 as shewn in the following map—



House to house census work in various areas undertaken subsequently indicate that the map is accurate to a very satisfactory degree.

During 1932 the Commission had a Central Laboratory in Kingston and one research field unit in Bath, a heavily infected area, where the disease was carefully studied. During this period of study, which yielded important clinical, serological, epidemiological and therapeutical information, it was found necessary to utilize trained sanitary inspectors to undertake accurate house to house census and inspection to find every infected individual in the area in the same manner as so successfully applied in the Hookworm Commission and the Tuberculosis Commission. The exact knowledge with respect to infected individuals and families thus obtained makes it possible to keep a constant look out for relapsed cases and new cases and generally to give exact information as to the effects of successive treatment campaigns by the use of frequent re-surveys.

In April, 1933 a second field unit was established, similar to the first, to apply these methods of survey follow-up of cases and treatment so as to judge of their applicability as a routine procedure for control, while the research unit continued its studies in the Bath area.

This second unit moved rapidly over the two heavily infected areas of Castleton and Richmond during the year, the infection rates among the people ranging from 30% to 60%. With regard to the work, Dr. T. B. Turner, Clinical Director of the Commission, observes, "The general plan of control consists of three essential phases, survey, treatment and follow-up ..... During the treatment period there should be no infectious cases in the area, but in a short while perhaps within a few weeks new infection cases are likely to occur from one or more of three possible sources: 1. Infectious relapses following treatment. 2 New infections contracted before treatment begins in an area but not manifest until the regular treatment period is over. 3. Infectious cases moving into the district."

In the years prior to these investigations the main effort on yaws had been directed towards providing treatment—which was usually only to a palliative degree—for cases after infection had become apparent, whereas, the work of the Commission has shewn that it is possible to find all infectious cases in a given area and reduce them to non-infectiousness simultaneously in a short time and, then, by subsequent re-surveys and re-treatments at regular intervals, to effect progressive and cummulative reduction in the number of active infectious cases with a resultant continuous decline in the infection rate of the area.

Accordingly in the latter half of 1933 a new plan of Campaign was prepared and approved by the Central Board of Health attacking the problem from a preventive standpoint, designed to co-ordinate all the existing permanent medical and sanitary services of the Island, the main features of which are:—

(a) Sanitary Inspectors under the direction of the Medical Officers of Health now present cases for treatment instead of District Constables as was formerly done.

(b) The sanitary inspector carries out a house to house census in a defined area as done by the Hookworm Commission, and the yaws status of every individual in the area is recorded.

(c) A temporary Treatmeht Centre is established in the area by arrangement between the District Medical Officer and the Medical Officer of Health so located as to be within easy distance for all cases to be dealt with, and the Sanitary Inspector attends with the cases which he has instructed to come for treatment.

(d) Every effort is made to give each case a full course of treatment consisting of six injections, with an interval of one week between them, so that a Treatment Centre should run for 8 to 12 weeks.

(e) While the treatment in one area is nearing completion, a new area continuous with the first is censused and the Treatment Centre is shifted systematically from district to district.

(f) As far as possible the work is planned so that re-surveys and re-treatment of previously treated areas are undertaken at intervals of four to six months and the process of re-surveying must coninue as long as yaws exists.

(g) The cases to be given priority in treatment are those with infectious lesions in order to check the occurrence of secondary cases.

(h) Failure of patients to present themselves when required by the Sanitary Inspector is to be dealt with by the Medical Officer of Health under the Yaws Notification Law.

(i) Suitable records of census and treatment are kept on which will show later the results of the programme.

It is essential that staffs of Local Boards of Health be well trained in their duties and in the nature and manifestations of the disease itself. The use of qualified sanitary inspectors with their previous training and activities in communicable disease control has already shewn that they are particularly fitted to undertake yaws control among their ordinary duties on disease control.

It has been shewn that Bismuth is satisfactory in this plan of control and has to be used for purposes of economy for the great majority of treatments but Neoarsphenamine is provided for cases resistant to Bismuth.

To put this plan into operation the Governor was advised to (a) order Local Boards of Health, who had hitherto taken no part in the control, to carry out such work as was necssay to complete the plan under Section 11(1) of the Public Health Law 18 of 1925, (b) order 13 District Medical Officers, who had formerly drawn fees for yaws treatment, to undertake treatment without remuneration, (c) give authority to all Health Officials of Central and Local Boards to act under Section 5 of the Yaws Notification Law 23 of 1910, which authority had previously been in the hands of District Medical Officers and District Constables only.

The effect of these orders is that the whole of the Medical and Sanitary Services of Central Government and Local Boards of Health are now actively engaged in the control of yaws with greatly increased efficiency and that the sums formerly allotted for fees to District Medical Officers and District Constables are now available for the intensive activities of the Mobile Units in heavily infected areas.

The total number of treatments given for the year is as follows:—

District Medical Officers	37,240
Medical Officers of Health	10,781
Yaw Commissions	9,550
	57,571

4. Water Supplies.

Kingston.—The satisfactory bacteriological standard of this supply was well maintained during the year.

Trelawny.—The Sawyers Tank with concrete catchment area was completed to contain 60,000 gallons.

St. Thomas.—The Yallahs Standpipe was completed and a 80,000 gallon tank provided for Bull Bay.

In other parishes minor improvements to rural supplies were carried out.

5. Food Supplies.

No progress was made in providing Slaughter Houses with adequate Regulations, the only places provided being Kingston, Halfway Tree, Spanish Town and Falmouth, and meat inspection outside of these towns leaves much to be desired, although improvement in meat control is noted in some townships of Portland, St. Mary and Trelawny. Better control can only be effected by the provision of inspection sheds in townships, with regulations applicable to defined areas around such townships.

In the Kingston Slaughter House, Tuberculosis of meat and various organs in cattle accounted for condemnation of 13,135 lbs. and 1,369 cows' livers were condemned for liver fluke.

Considerable publicity was given to the importance of clean milk and some progress in dairy sanitation was made. Increasing trade with resultant business competition is gradually necessitating improved methods of handling and transportation, but more vigorous enforcement of the dairy regulations is desirable to hasten improvement in the sanitary standards of milk production which are low on the whole.

The Lactometer test is still in general use and this should be abolished as misleading and of very little value in control of adulteration.

There was further improvement in supervision of foodhandlers, but the great amount of time spent by Health Officers in physical inspection is entirely out of proportion to the results which are accomplished in preventing the food transmission of communicable disease and the whole plan for the control of foodhandlers needs to be modernised, though increased laboratory facilities will be required.

6. Maternity and Child Welfare.

The activities under this heading continued as reported in previous years with some increase in the total number of children receiving attention.

7. Educational Measures.

The report of the Bureau of Health Education is to be found in Appendix III.

The addition of yaws control to the duties of the Sanitary Inspector gives increased opportunities for home educational visits on Communicable Disease. The practice of home visits to families infected with tuberculosis, typhoid fever and other major communicable disease by the Health Officers, and frequent follow-up visits with verbal and written instructions on prevention of spread, is now well established in the greater part of the Island, and the results achieved by trained Sanitary Inspectors in yaws and tuberculosis survey work prove the importance of extending this service.

In spite of the excessive rains 1933 Health Week was well celebrated throughout the Island, Health Officers undertaking the organisation of most of the public meetings.

8. Parochial Health Departments.

Table XIII shews the work reported by Parochial Health Departments during the year.

TABLE XIII.

	Kingston.	St. Andrew.	St. Thomas.	Portland.	St. Mary.	St. Ann.	Trelawny.	St. James.	Hanover.	Westmoreland.	St. Elizabeth.	Manchester.	Clarendon.	St. Catherine.	
I. *Administration*—			a.			a.				a.		a.			
Letters No. received	627	1,805	439	178	614	..	381	565	74	168	344	158	..	528	5,881
Letters No. issued ..	823	1,771	442	464	606	..	593	599	70	153	276	267	597	982	7,643
Telegrams, No. received ..	..	..	22	18	32	..	26	30	4	10	36	12	10	15	215
Telegrams, No. issued	..	..	19	17	39	..	37	42	4	12	31	27	7	15	250
No. of miles travelled by M.O.H. ..	5,147	6,000	2,814	6,555	6,494	..	6,778	3,780	3,470	356	9,612	7,984	6,238	7,116	72,344
II. *Health Education*—															
Lectures—M.O.H. and S.I. ..	34	..	..	27	93	22	14	21	17	26	52	35	12	42	395
Attendance ..	7,040	..	..	4,682	10,985	..	686	..	1,498	..	..	4,977	1,390	2,420	33,678
III. *Communicable Disease Control*—															
1. Cases reported:															
*Pul. T.B.—Total cases notified	360	140	35	76	102	99	44	77	24	29	32	30	80	112	1,240
" Notified by M.O.H.	2	..	..	47	45	68	18	44	..	27	..	20	12	43	326
†" No. of deaths	136	267	49	59	97	88	40	44	33	53	88	67	54	116	1,191
Typhoid—Total cases notified	221	165	44	63	49	41	100	89	12	35	35	49	147	42	1,092
" Notified by M.O.H.	..	..	..	..	8	36	11	..	..	11	..	14	8	..	88
†" No. of deaths	71	6	11	7	20	9	11	23	5	17	5	8	15	· 15	223
*Other Disease— Total cases notified ..	157	101	4	19	41	66	17	45	42	21	6	24	45	16	604
Notified by M.O.H.	8	..	..	9	12	7	6	..	5	5	..	..	3	3	58

* Does not include Port Royal. † Supplied from Registrar General's Report. a. Health Officers are part-time and have private practice.

	Kingston.	St. Andrew.	St. Thomas.	Portland.	St. Mary.	St. Ann.	Trelawny.	St. James.	Hanover.	Westmoreland.	St. Elizabeth.	Manchester.	Clarendon.	St. Catherine.	
III. *Communicable Disease Control, Contd.*			a.			a.				a.		a.			
2. Laboratory work:—															
Specimen examined ..	3	10	..	15	570		36	194	..	..	4	24	‡4,301	433	5,592
Specimen positive	2	9	..	4	93	2	14	61	..	..	2	14	2,832	198	3,231
3. Isolation and Quarantine:—						2									
Cases sent to I. D. Hospital ..	4	..	..	..	..		..	..	4	..	..	..	..	1	9
Cases isolated in the home ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Visits of investigation ..	697	580	55	167	228	66	3,923	233	66	12	911	181	146	340	7,605
Consultations with doctors	24	..	28	8	1	2	..	..	3	..	15	11	2	10	104
4. Prophylaxis and Treatment:—															
Anti-typhoid inoculations ..	2,453	..	228	3,929	1,242	481	8,894	542	49	731	1,398	8,680	2,155	1,434	32,216
Small-pox vaccination ..	2	..	..	12	..	1	..	..	..	2,001	..	..	..	..	2,016
Malarial cases treated ..	..	..	1,172	..	13	..	..	947	53	515	1,299	64	..	2	4,065
Hookworm cases treated	..	..	..	..	6	2	..	..	..	129	55	..	8,534	96	8,822
Diphtheria— units of serum	50,000	..	..	..	..	..	..	..	..	40,000	..	..	..	..	90,000
5. Tuberculosis Control:—															
No. of Clinics held ..	..	..	..	40	52	..	49	156	..	..	12	220	..	57	586

‡ Faecal examinations for Hookworm infection by special treatment staff. a. Health Officers are part-time and have private practice.

TABLE XIII, *Contd.*

	Kingston.	St. Andrew.	St. Thomas.	Portland.	St. Mary.	St. Ann.	Trelawny.	St. James.	Hanover.	Westmoreland.	St. Elizabeth.	Manchester.	Clarendon.	St. Catherine.	
III. *Cummunicable Disease Control, Contd.*—			a.			a.				a.		a.			
Visits by Nurse and Sanitary Inspector ..	..	..	..	164	404	..	196	75?	..	..	70	..	..	1,232	2,818
Total Attendance at Clinics	..	..	..	46	629	..	290	1,416	..	..	62	240	..	449	3,132
6. Terminal Disinfections ..	542	246	..	92	67	13	140	..	20	49	40	57	..	105	1,371
IV. *Child Hygiene*—															
1. Infant Clinics:—															
Clinics held ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total births registered ..	..	..	..	..	..	..	..	..	..	..	..	..	..	3,725	3,725
Infants examined	..	..	..	..	..	..	..	..	..	..	..	..	..	36	36
Visits of Nurse	..	..	..	..	..	..	..	..	..	..	..	..	..	1,544	1,544
Babies under supervision on 31.12.33 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	117	117
2. School Dental Clinics:—															
Hours of work	456	456	..	537	738	..	268	..	502	..	..	..	220	156½	3,333½
No. new children examined ..	1,850	1,977	..	..	3,623	..	485	1,865	3,846	..	..	..	2,222	1,549	17,417
No. new children treated ..	..	1,977	..	2,340	..	..	296	..	3,846	..	..	..	1,319	no record	9,778
Prophylaxis ..	2,551	2,355	..	1,546	2,333	..	589	1,518	..	..	..	..	1,744	74	12,710
Fillings ..	785	1,492	..	1,804	4,064	..	866	1,632	674	..	..	..	535	338	12,190
Extractions ..	2,148	1,322	..	982	2,148	..	738	1,680	3,012	..	..	..	1,399	652	14,081
Abscess treatments ..	..	..	..	..	4	..	12	..	..	..	..	..	157	no record	173
Other treatments	270	236	..	493	..	..	272	..	589	..	..	..	..	29	1,889
V. *Sanitation*—															
1. General:—															
New latrines installed ..	92	777	306	195	612	1,968	1,335	67	208	321	375	1,108	604	1,353	9,321

a. Health Officer are part-time and have private practice.

TABLE XIII. *Contd.*

	Kingston.	St. Andrew.	St. Thomas.	Portland.	St. Mary.	St. Ann.	Trelawny.	St. James.	Hanover.	Westmoreland.	St. Elizabeth.	Manchester.	Clarendon.	St. Catherine.	
V. Sanitation, Contd.—			a.			a.				a.		a.			
Old latrines repaired ..	129	1,254	317	478	1,586	693	244	565	5	8	59	815	1,053	2,357	9,563
Water samples taken ..	..	..	4	11	..	1	..	14	3	..	10	7	..	5	55
No. Inspections Water Supplies ..	..	..	328	522	631	280	153	17	24	12	134	..	192	231	2,524
2. Food Sanitation:															
No. of dairies on register 31.12.33 ..	7	201	60	25	..	6	16	19	..	11	..	..	8	62	415
Visits to dairies	406	789	67	86	..	17	124	6	1	60	49	11	33	145	1,794
No. of Milk Shops ..	68	7	26	6	..	..	..	..	..	..	..	..	..	67	174
Visits to Milk Shops ..	3,388	337	76	68	..	..	15	..	4	..	..	..	..	106	3,994
Samples of milk taken ..	1,922	773	12	790	262	3	..	2,250	..	95	27	..	6	184	6,324
No. of impoverished milks ..	1	3	2	3	5	..	..	13	..	..	2	..	..	1	30
Meat:															
No. of inspections ..	22,439	3,460	704	2,805	3,827	3,360	1,389	364	341	420	2,960	1,976	760	1,853	46,658
No. condemned meats ..	4,200	962	10	147	55	1	21	52	1	7	10	7	5	213	5,691
No. of visits to Slaughter Houses ..	25	1,670	182	2	275	299	283	45	..	100	58	74	..	..	3,013
Other Foods:															
No. of inspections ..	15,774	..	1,578	2,597	7,624	7,626	1,255	474	380	371	1,719	2,882	3,827	5,440	51,547
No. of condemnations ..	138	..	94	114	129	414	12	118	47	5	48	223	58	244	1,644
No. Foodhandlers examined	4,558	2,023	..	3,373	6,266	13,257	3,919	2,094	3,866	1,045	1,385	2,781	..	10,577	55,144

a. Health Officers are part-time and have private practice.

TABLE XIII, *Contd.*

	Kingston.	St. Andrew.	St. Thomas.	Portland.	St. Mary.	St. Ann.	Trelawny.	St. James.	Hanover.	Westmoreland.	St. Elizabeth.	Manchester.	Clarendon.	St. Catherine.	
V. Sanitation, Contd.—			a.			a.				a.		a.			
3. Inspection of Construction other than Latrines:—															
Plans submitted to H.O. ..	1,534	719	..	..	..	..	..	22	..	..	..	..	1	..	2,276
Plans approved	678	664	..	..	..	..	..	22	..	..	..	..	1	..	1,365
Pans rejected ..	89	55	..	..	..	..	..	..	..	..	..	..	..	..	144
4. Malaria and Mosquito Control:-															
No. of places where larvae found ..	817	567	370	164	268	..	12	158	59	406	620	245	5	139	3,830
Anopheline ..	..	6	84	20	39	..	12	68	6	276	120	5	..	1	637
Others ..	817	261	168	144	229	21	20	90	53	466	300	152	5	138	2,864
No. of breeding places treated	..	567	..	163	252	21	12	158	..	466	175	25	5	183	2,027
5. Sanitary Inspections ..	91,766	26,182	4,810	20,570	39,413	24,769	22,076	5,757	8,536	3,729	7,911	31,838	20,787	60,344	368,488
6. Nuisances:—															
No. of complaints ..	355	636	..	..	406	439	..	25	4	150	121	..	13	80	2,229
No. of nuisances found ..	..	2,580	..	231	..	36	1,847	74	50	150	81	1,288	13	4,831	7,181
No. of Nuisances abated ..	315	2,708	1,628	197	383	460	1063	71	13	145	75	1,288	13	819	9,178
VI. *Legal*—															
No. written notices issued ..	2,328	2,708	930	1,134	2,904	1,756	2,553	797	59	645	1,793	1,288	4,406	5,330	28,631
No. written notices obeyed ..	1,358	1,237	918	832	1,625	450	1,786	606	23	608	715	1,288	2,058	4,067	17,571
No. of prosecutions..	70	14	..	8	1	83	293	21	6	6	..	81	84	198	865
No. of convictions ..	46	12	..	1	1	49	..	7	1	3	..	68	84	186	458
No. of complaints ..	..	638	..	..	..	..	..	..	..	..	..	..	13	..	651

a. Health Officers are part-time and have private practice.

There has been improvement in various phases of communicable disease control such as case finding and follow-up, laboratory work, and chest clinics. Health Officers notified 26% of the total number of cases of tuberculosis and 8% of the typhoid and examined 5,592 laboratory specimens of sputum and faeces. There was a total attendance of 3,132 persons at chest clinics, and Sanitary Inspectors recorded 2,818 homes visits to cases of tuberculosis.

A satisfactory start was made on the new Yaws plan, a total of 23,839 cases were found in a population of 302,107, and during the period when it was necessary for Medical Officers of Health to assist in treatment they gave 10,781 treatments.

9. School for Sanitary Inspectors.

The Fifth Session of the School for Sanitary Inspectors opened on 15th November, 1932, and ended on 3rd March, 1933. Of 27 students, 14 were from the staffs of the Central and Local Boards of Health. 19 students sat for the Examination of the Royal Sanitary Institute with 1 failure. 1 of the 27 failed to obtain the Local Government Certificate as a Sanitary Inspector.

During the five Sessions of the School since 1927, 110 men have received training and 66 of them have obtained the Certificate of the Royal Sanitary Institute.

10. Recommendations.

The Senior Sanitary Medical Officer recommends:—

1. Increase of clerical staff of Central Board of Health in view of the great increase of clerical work involved in (i) taking over the Hookworm Commission and Malaria Commission from the Rockefeller Foundation, (ii) the new plan of Yaws Control, (iii) the new activities on Tuberculosis.
2. Establishment of a vital statistics section for the Central Board of Health.
3. A School Medical Service.
4. Increased laboratory facilities to meet the requirements of trained Health Officers in control of food, milk and Communicable Disease.
5. Re-surveys for Hookworm infection and infestation in areas where treatment has been previously undertaken and in which sanitation is being adequately maintained.
6. Extension of Malaria Control Programme.
7. Development and Extension of Child Welfare Service in view of the fact that the Infant death rate has shewn considerable improvement in Kingston where these measures have been provided.
8. In the Corporate Area of Kingston and St. Andrew—
   (a) A complete programme of mosquito control in the lowland areas in view of the great increase of malaria and aeroplane communication with parts of South America liable to infection with Yellow Fever from the endemic areas there. The increasing use of the coastal areas to the east of Kingston as far as Bull Bay for evening recreation which are at present heavily infected with malaria calls for active control measures.
   (b) Vigorous measures to reduce the incidence of typhoid fever in Kingston which is still far too high for a city of the size and importance of Kingston.
   (c) Development of Housing Schemes in Kingston to replace slum areas.
   (d) Provision of field staff trained to carry out adequate home supervision of cases of Communicable Disease particularly typhoid and tuberculosis.
9. Abolition of pail systems of excreta disposal particularly in such towns as Port Maria and Annotto Bay.
10. In St. James—(a) Purification of the water supply of Montego Bay and (b) an adequate programme of mosquito control for Montego Bay.

J. M. Hall,
Senior Sanitary Medical Officer.

IV.—PORT HEALTH WORK.

The year 1933 has been routine throughout.

The Quarantine Regulations have been carried out thoroughly and systematically during the year and it is a pleasure to me to be able to report that we have closed the year free from quarantinable diseases.

While every effort is made to keep out Small Pox internal protection by vaccination should be our first line, otherwise trade would be unnecessarily hampered.

Our main efforts are concentrated on Plague and Yellow Fever.

There was an outbreak of Alastrim in Belize during the year. The regulations for Small Pox came into force here at once and no cases arrived on vessels from there.

There is a service of Seaplanes between this Island and the Republic of Columbia with connection to the South, and as Yellow Fever is endemic in Brazil, the greatest care has to be exercised and the place of origin of each passenger is ascertained.

It has been shown that Yellow Fever Mosquitoes (Stegomyia) can travel by planes at a great altitude without being affected and while an examination of a plane here did not disclose their presence the greatest care is necessary to prevent the introduction of Yellow Fever. 270 Seaplanes arrived during the year and 3 Airplanes.

The arrival of sailing vessels at the outbays of Jamaica had the attention of the Board during the year and steps were taken to prevent any possible contact with the shore, until after pratique had been given.

During the year, Captain List and Dr. McLean were granted leave also the Health Officer at Port Royal.

1,203 vessels were granted pratique at Port Royal during the year and the Service there has been carried out efficiently and without delay.

A scale of fees for fumigation of vessels by Cyanide was approved by the Governor in Privy Council during the year.

The Quarantine Station is in good order and ready to receive passengers at any moment. There were no dententions during the year.

Extensive repairs were necessary to the Boarding Launch. It is now giving satisfactory service.

After the departure of Dr. Wilson on pension, Dr. Henderson acted for a short time as Chairman of the Quarantine Board, and on his leaving to take up the appointment of Surgeon-General of British Guiana, The Hon. Dr. Gifford took charge until the arrival of the present Chairman, Major T. J. Hallinan, C.B.E., who takes a great interest in all matters pertaining to Quarantine and whose advice can always be obtained on any matter of difficulty.

Dr. J. M. Hall was appointed Senior Sanitary Medical Officer and as such is a member of the Quarantine Board and will be a most useful member in every way.

CHARLES DON,
Secretary, Quarantine Board.

V.—HOSPITALS AND DISPENSARIES.

The following is a list of the hospitals and institutions of the Medical Department:—

	No. of beds.
Public Hospital, Kingston	380
Maternity Hospital, Kingston ..	30
Public Lunatic Asylum, Kingston ..	1,864
Public General Hospital, Morant Bay ..	30
Do. do. Hordley ..	40
Do. do. Pt. Antonio ..	55
Do. do. Buff Bay ..	50
Do. do. Annotto Bay ..	60
Do. do. Pt. Maria ..	65
Do. do. St. Ann's Bay ..	40
Do. do. Cave Valley ..	12
Do. do. Falmouth ..	25
Do. do. Ulster Spring ..	6
Do. do. St. James's ..	70
Do. do. Lucea ..	30
Do. do. Sav.-la-Mar ..	66
Do. do. Black River ..	70
Do. do. Mandeville ..	35
Do. do. Chapelton ..	33
Do. do. Lionel Town ..	50
Do. do. Spanish Town ..	70
Do. do. Linstead ..	60
Lepers' Home, Spanish Town	120

The work of the hospitals was considerably increased as compared with 1932, the main cause of the increase being Malaria. The number of admissions for this disease was 4,963 or nearly twice the number admitted in 1932.

At the Kingston Hospital there were 7,351 cases treated, 821 deaths and 162,734 attendances at the Out-patients Department, 1,692 major and 1,667 minor operations were performed. In the X-Ray Department 2,293 patients attended with 6,500 exposures as compared with 1,950 patients in 1932.

In the District Hospitals there were 19,149 cases treated with 1,156 deaths and 63,892 attendances at the Out-patients Department. 1,591 major and 7,762 minor operations were performed.

In accordance with the policy for improving medical facilities to people at distances from hospitals the number of Dispensaries and Out-stations was increased from 12 to 26.

BUILDINGS.

With a few exceptions such as the Montego Bay Hospital and parts of the Kingston Public Hospital, hospital buildings generally are in need of considerable improvements or replacement as the majority were built over fifty years ago of wood. The brick buildings are still in fair or good condition but the wooden buildings now require so many repairs that it is impossible with the funds available to do more than keep them adequate for the reception of patients and very few improvements are possible.

KINGSTON PUBLIC HOSPITAL.

As there appears little prospect of the scheme for rebuilding and improving the Kingston Public Hospital to be possible of acceptance for several years on account of the large capital cost involved, it has been deemed advisable to consider developments and improvements of the hospital within its existing buildings which are of brick and of good construction. Accordingly a rearrangement of some of the Hospital Wards and Departments has been commenced. New and larger quarters for the Dispensary with a large room for patients awaiting medicines had been completed by the end of the year and the transfer of the patients in the Venereal Wards to the Under Building and conversion of these wards into a new Surgical Block was under way.

A new Operating Theatre and a X-Ray Department are much needed when funds permit.

T. J. HALLINAN,
Superintending Medical Officer.

(A) *Report and Returns of the Medical Superintendent, Kingston Public Hospital.*

Table 1 and 2 show the number of cases during the year with results. The total deaths from all causes for the year was 821;—464 males, 357 females.

Table 3 shows the number of, deaths occurring within 12 and 72 hours after admission.

Table 4 shows the number of patients admitted into hospital during the year 1933 and the countries and parishes in Jamaica from which those in-patients had their origin.

Table 5 shows in detail the number of surgical and medical cases under the various headings, treated during the year with results.

Table 6 shows in detail the various surgical operations performed.

Table 7 shows the work done in the Venereal Disease Clinic.

Table 8 shows the number of Casualties and Out-Patients treated during the year—also in the special Departments of Eye, Ear, Nose and Throat. Also the number of prescriptions dispensed for those Departments.

Table 9 shows the statistical table of work performed at the Dental Clinic attached to the Public Hospital, Kingston.

Table 10 shows the work of the Department of Radiology.

The deaths during the year show an increase to the previous year. The total during 1932 was 661, while in 1933 the total was 821. On the other hand the total admissions for 1932 were 6,232; while the total admissions for 1933 were 6,962. Pneumonia and Amoebic Dysentery show marked increase in the number of deaths.

There has been difficulty during the year for want of accommodation,—the highest number in hospital for one day being 448 in May—the approved estimates being 380. During December, the lowest was 282. This was due to the approach of Xmas, but immediately the festive season was over, the numbers began to rise. I forsee the same difficulty during the coming year.

The New Out-Patients Department is still unsatisfactory so far as accommodation is concerned. More space is needed. The Eye Clinic has increased enormously and the time has come when this Department should be housed in a separate block.

The three dispensaries were amalgamated during the year under review. Arrangements were also made for the division of the hospital into Surgical and Medical units.

The Department of Radiology has done very creditable work during the year under review. The space allotted is entirely too small for the efficient performance of the duties. An office for the Radiologist and a waiting room for patients are urgently needed. More equipment is necessary for carrying out electro-therapeutics and it is hoped that soon radium will be available for treatment of cases. Very often malignant cases have to be sent away—surgical intervention contra-indicated—radium holding out the only hope.

Dr. B. M. Wilson, the Chief Medical Officer retired during the year, and was succeeded by Major Hallinan.

Drs. Westmorland, Stockhausen and Morrison went on leave during the ye ar.

Dr. Golding was appointed sixth Resident Medical Officer.

Drs. Binns, Preston, Robb and Shirley joined the Staff as Supernumeraries during the year.

Dr. Binns was transferred to Port Royal while Dr. Preston resigned in December.

Dr. Ferguson was transferred to Port Antonio in December.

The Nursing Staff has carried on their duties creditably during the year. The nurses in training have been lectured regularly by the Medical Officers and the Assistant Matron. During 1934, it is hoped that post graduate lectures will be given to head and staff nurses. Facilities have been afforded during the year for qualified nurses to be trained in midwifery at the Victoria Jubilee Hospital—the course lasting six months. About eight nurses have taken advantage of this opportunity.

The strength of the nursing staff is 138,—107 are probationers in training. Of these, 62 live in the Nurses' Home. Twenty-seven nurses sat for their final examinations—18 passed, 9 failed.

Forty-one country hospital nurses presented themselves for examination—18 were successful, 23 failed.

Two Staff Nurses were appointed Sisters during the year. Nurse Brooks, after 36½ years service, retired on pension. Sisters Russell and Parchment resigned during the year.

It is hoped that during the coming year a trained Masseuse, or if possible, another Assistant Matron with qualifications in massage wil be appointed to the Staff.

The dispensers and dispensary apprentices have done their duties efficiently during the year under review.

During the year there were 21 whole-time and 16 part-time students under training.

Six students qualified during the year and received their certificates.

Four part-time students qualified.

One student died.

The Rev. G. H. Thompson, who was Chaplain to the Hospital, died on August 15, 1933, after over 20 years service.

His successor is the Rev. Eric Maxwell.

Religious services are held every Sunday. Provision will have to be made for a place where services can be conducted as the room in which this is now held will be used for the purposes of the dispensary early in the coming year.

His Excellency the Governor and Lady Slater visited the Hospital on Xmas Day—distributed toys to the children, and made a tour of the Hospital.

The Board of Visitors made several visits during the year.

Several medical men from abroad have visited the Institution during the year.

On behalf of the patients, I have to thank all those who have sent magazines, books, etc.

I have to place on record my high appreciation of the loyal co-operation of the entire staff of Medical Officers, Matron, Assistant Matron and subordinates, for their assistance and zeal in the efficient performance of their arduous duties during the whole year while Dr. Westmorland, the Medical Superintendent, was in charge (now on leave), and while I have been acting for him.

Table 1.

	Males.	Females.	Total.
Patients remaining in hospital 1st January, 1933	230	159	389
Patients admitted during the year 1933 ..	3,763	3,199	6,962
Total Patients treated ..	3,993	3,358	7,351
Of those were cured	1,897	1,820	3,717
Of those were relieved	1,207	857	2,064
Of those were not relieved	233	201	434
Of those died	464	357	821
Remaining in Hospital, December, 1933 ..	192	123	315
	3,993	3,358	7,351

Table II.

Daily average number of beds occupied by male patients ..	217
Daily average number of beds occupied by female pateints ..	179.6
Average stay in days of those who died, males	10
Average stay in days of those who died, females	9.6
Average stay in days of males, discharged	25
Average stay in days of females, discharged	23
Average stay in days of males remaining at end of year	26
Average stay in days of females remaining at end of year ..	22
Longest stay of any one patient in Hospital	365 days.

Table III.

Patients who died within the following hours after admission:—

12		24		48		72		Total.	
Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
78	53	71	66	47	31	19	26	215	176

Table IV.

Countries.	No.	Parishes.	No.
America ..	9	Kingston ..	4,845
Canada ..	4	St. Andrew ..	2,092
China ..	16	Port Royal ..	25
Cuba ..	11	St. Thomas	36
England ..	46	Portland ..	36
Germany ..	5	St. Mary	37
Grand Cayman ..	13	St. Ann ..	19
Haiti ..	2	St. James	3
India ..	47	Trelawny	9
Ireland ..	5	Westmoreland	2
Jamaica	7,161	St. Elizabeth	13
Norway ..	7	Manchester	19
Panama ..	5	Clarendon ..	75
Russia ..	3	St. Catherine	65
Scotland ..	2	Hanover	3
Spain ..	5	Foreign ..	72
Trinidad ..	3		
Turks Island ..	7		
	7,351		7,351

Table V.—Diseases and Deaths in the Kingston Public Hospital during 1933.

	Cases.	Deaths.
I. *Epidemic, Endemic and Infectious Diseases—*		
1. Enteric Fever	298	59
5. Malaria Fever	427	11
7. Measles	23	
8. Scarlet Fever	1	
9. Whooping Cough	2	
10. Diphtheria	4	2
11. Influenza	187	
13. Mumps	4	
16. Dysentery:		
(a) Amoebic	72	17
(b) Other or Unspecified	16	10
18. Yaws	2	
21. Erysipelas	1	
22. Acute Poliomyelitis	6	1
29. Tetanus	14	11
Tuberculosis (all forms)		
31. Respiratory System	65	10
32. Central Nervous System	3	2
33. Intestines and Peritoneum	15	4
34. Vertebral Column	5	
35. Joints	16	2
36. Other Organs	40	6
37. Disseminated Tuberculosis:		
(a) Acute Miliary T.B.	1	1
38. (1) Syphilis	452	27
(2) Congenital Syphilis	13	9
40. (1) Gonococcal Infection	187	1
(2) Gonorrhœal Ophthalmia	8	
41. Septicæmia	14	10
II. *General Diseases not included in I—*		
Cancers—		
44. Pharynx, Œsophagus, Stomach, Liver and Annexa	26	5
45. Peritoneum, Intestines and Rectum	5	1
46. Female genital organs	27	5
47. Breast	19	
49. Other or unspecified Organs	8	3
50. Tumours not returned as malignant	47	
51. Rheumatic Fever	7	
52. Chronic Rheumatism, Osteoarthritis, Gout:		
(1) Chronic Rheumatism, Chronic Arthritis	35	
(2) Rheumatoid Arthritis, Osteo Arthritis	22	1
54. Pellagra	3	3
56. Ricketts	2	
57. Diabetes Mellitus	41	12
58. (a) Pernicious Anaemia	2	
(b) Other anaemias	6	
60. (a) Exophthalmic Goitre	6	1
(b) Other Diseases of the Thyroid Gland	2	
66. Alcoholism (acute or chronic)	5	
67. Chronic poisoning by mineral substances	5	
68. " " " organic substances	2	
69. Other general Diseases	2	
III. *Diseases of the Nervous System and Sense Organs—*		
70. (1) Cerebral Abscess	1	1
(2) Other diseases included under 70	3	
71. Meningitis	13	12
72. Tabes Dorsalis	12	
74. (1) Cerebral Haemorrhage—Thrombosis	10	9
(2) Apoplexy—Cerebral Haemorrhage	9	2
(3) Cerebral Embolism	3	
75. (a) Hemiplegia	23	1
(b) Other forms of paralysis	14	1
76. General paralysis of the Insane	2	
77. Other forms of Insanity	11	
78. Epilepsy	9	
79. Convulsions (non-puerperal)	3	
80. Infantile Convulsions (under 5 years)	6	1

	Cases.	Deaths.
82. (1) Hysteria, Neuralgia	22	
(2) Neuritis	16	
84. Other Diseases of the Nervous System:		
(1) Idiocy, Imbecility	5	
(2) Cerebral Tumour	1	1
(3) Disseminated Sclerosis	2	
(5) Other Diseases included under 84	6	
85. Diseases of the Eye and Annexa	193	
86. (1) Diseases of the Mastoid Sinus	12	
(2) Diseases of the Ear	9	
IV. *Diseases of the Circulatory System—*		
87. Pericarditis	3	1
88. (1) Endocarditis	19	5
(2) Myocarditis	43	10
90. (1) Aortic Valve Disease	10	2
(2) Mitral Valve Disease	31	13
(3) Aortic and Mitral Valve Disease	3	2
(4) Other and unspecified Valve Disease	7	3
(8) Disordered action of the heart	21	14
(9) Heart Diseases unqualified	75	36
91. Diseases of the Arteries:		
(a) Aneurysm	11	7
(b) Arterio-Sclerosis	1	
(c) Other Diseases of the Arteries	2	
92. Embolism and Thrombosis (not Cerebral)	1	
93. Diseases of the Veins	42	
94. Diseases of the Lymphatic System	94	
95. Haemorrhage without stated cause	12	
96. Other diseases of the Circulatory System	2	
V. *Diseases of the Respiratory System—*		
97. (1) Diseases of the Nasal fossa and Annexa	1	
(2) Diseases of the accessory Nasal Sinuses	36	
98. (1) Laryngismus Stridulus	1	
(2) Laryngitis	2	1
99. (a) Acute Bronchitis	12	1
(b) Chronic Bronchitis	35	2
(c) Bronchitis (not distinguished)	84	1
100. Broncho-pneumonia	138	53
101. Pneumonia—(a) Lobar pneumonia	193	52
(b) Pneumonia (not defined)	155	54
102 Pleurisy—(1) Empyema	11	3
(2) Other Pleurisy	53	4
103. Congestion and Haemorrhage infarct of lung	2	1
105. Asthma	11	
107. Other Diseases of the Respiratory System	5	
VI. *Diseases of the Digestive System—*		
108. (1) Diseases of the teeth and gums	28	
(2) Ludwig's Angina	1	
(3) Other Diseases, included under 108	4	
109. (1) Tonsilitis, Adenoid Vegetations	40	
(2) Other Diseases included under 109	3	
110. Diseases of the Oesophagus	1	
111. (a) Ulcer of the Stomach	26	5
(b) Ulcer of the Duodenum	17	1
112. (1) Inflammation of the Stomach	28	
(2) Other Diseases included under 112	36	
113. (1) Ulceration of the Intestines	7	7
(2) Colitis	51	9
(3) Other diseases included under 113	228	78
115. Ankylostomiasis	17	
116. Diseases due to other intestinal parasites	28	3
117. Appendicitis	585	17
118. (a) Hernia	134	3
(b) Intestinal Obstruction	33	13
119. (1) Intestinal Stasis	81	
(2) Other diseases under 119	46	1
120. Acute yellow atrophy of the liver	1	
122. (b) Cirrhosis of th e liver not returned as alcoholic	26	6
123. Biliary calculi	3	
124. Other diseases of the liver	40	8
126. Peritonitis without stated cause	16	6

	Cases.	Deaths.
VII. *Non-Venereal Diseases of the Genito-Urinary System and Annexa*—		
128. Acute Nephritis (including unspecified under 10 years)	25	14
129. Chronic Nephritis (including unspecified over 10 years)	70	36
131. Other diseases of the Kidney and Annexa	40	1
132. Calculi of the Urinary passages	7	
133. (1) Cystitis	20	2
(2) Other diseases of the bladder	21	
134. (a) Stricture of the Urethra	47	5
(b) Other diseases of the Urethra, etc.	76	1
135. Diseases of the prostate	20	
13 . Non-Venereal diseases of the male genital organs	150	
137. Cysts and other tumours of the ovary not returned as malignant	28	
138. (1) Salpingitis	249	11
(2) Pelvic Abscess in females	12	2
139. Tumours of the Uterus not returned as malignant	127	3
140. Non-puerperal uterine hæmorrhage	20	
141. (1) Other diseases of the Uterus	132	
(2) Diseases of the other female genital organs not included under other headings	107	1
142. Non-puerperal diseases of the breast	9	
VIII. *The Puerperal State*—		
143. (a) Abortion	56	
(b) Ectopic gestation	12	2
(c) Other accidents of pregnancy	34	1
144. Puerperal hæmorrhage	3	
145. Other accidents of Childbirth	22	
146. Puerperal Sepsis	3	2
148. Puerperal albuminuria and convulsions	3	
IX. *Diseases of the Skin and Cellular Tissue*—		
151. (1) Senile gangrene	5	2
(2) Other gangrene	5	1
152. Carbuncle, boil	13	
153. (1) Cellulitis	21	
(2) Acute Abscess	49	
154. (1) Ulcer, bedsore	166	
(2) Eczema	2	
(4) Other diseases included under 154	14	
X. *Diseases of the Bones and Organs of Locomotion*—		
155. (1) Acute osteomyelitis and periostitis	35	2
(2) Other diseases of the bones	7	
156. Diseases of the joints	15	
157. Amputations	47	
158. Other diseases of the Organs of Locomotion	29	
XI. *Congenital Malformations*—		
159. (3) Other Congenital malformations	16	1
XII. *Diseases of Early Infancy*—		
160. (1) Congenital debility and scleroma	13	12
161. (1) Premature birth	4	3
(2) Injury at birth	1	
162. (1) Diseases of the umbilicus	3	3
(3) Other diseases included under 162	1	1
XIII. *Old Age*—		
164. (2) Other forms of senile decay	2	1
XIV. *External Causes*—		
175. Food-poisoning	8	2
177. Other acute accidental poisoning (not by gas)	13	4
179. Accidental burns (conflagration excepted)	42	4
182. Accidental drowning	2	
183. Accidental injury by firearms	9	
184. Accidental injury by piercing or cutting instruments	132	2
185. Accidental injury by fall	46	
188. Accidental injury by other forms of crushing (road vehicles or railways, etc.)	136	27
192. Hunger or thirst	7	
196. Electricity (lightning excepted)	1	
201. Fractures	221	4
202. Other and unstated forms of accidental violence	67	
XV. *Ill-defined Diseases*—		
205. (2) Other ill-defined causes	279	7

Table VI.

	Cases.
I. *Operations upon Female Genital Organs*—	
Salpingectomy	218
Draining Pyosalpinx	7
Oophorectomy	136
Ovariotomy	6
Ovarian Cyst	18
Salpingo-oophorectomy	50
Broad Ligament Cysts	15
Myomectomy	4
Sub-Total Hysterectomy	96
Total Hysterectomy	1
Uterine Suspension	5
Curettage	98
Dilation of Cervix	10
Ectopic gestation	10
Therapeutic abortion	9
Perineorrhaphy	11
Draining pelvic abscess	7
Uterine Polpus	2
Colporrhaphy	1
II. *Operations on Hernia*—	
Radical cure—Inguinal	90
Femoral	4
Strangulated Hernia	10
Obstructed Hernia	6
Umbilical Hernia	4
Ventral Hernia	2
III. *Operations for Appendicitis*—	
Appendicectomy	591
Appendix Abscess	22
IV. *Operations upon the Stomach and Intestines*—	
Perforation of gastric ulcer	2
Perforation of duodenal ulcer	4
Intestinal obstruction	4
Laparotomy for volvulus	4
Gastro-enterostomy	5
Exploratory Laparotomy	26
Laparotomy for Tubercular Peritonitis	9
V. *Operations on the Bladder and Kidneys*—	
Supra pubic systotomy	10
Cystoscopy	1
Vesical calculus	4
Prostatectomy	2
Nephrectomy	2
VI. *Operations on the Urethra and Penis*—	
Dilating urethral stricture	65
Circumcisions	72
Amputation of penis	4
Reduction of paraphymosis	3
VII. *Operations on the Scrotum and Testicle*—	
Radical cure for hydrocele	14
Orchidectomy	6
VIII. *Operations on the Anus and Rectum*—	
Anal Fistulae	10
Hæmorrhoidectomy	25
Dilating rectal stricture	11
IX. *Amputations*—	
Legs	14
Toes	8
Fingers	15
X. *Operations on the Thorax*—	
Amputation of Breast for malignancy	33
Adenoma of Breast	19
Empyema-Resection of rib—Eslander's Operation	4
XI. *Operations upon the Ear*—	
Radical cure for mastoid	6
Conservative Operation for mastoid	4
XII. *Operations on the Nose, etc.*—	
Removal of adenoids	281
Tonsillectomy	539
Enucleation of Tonsils	8
Nasal Polyp	54
XIII. *Tracheotomy*—	2
XIV. *Operations on Tendons*—Suturing tendons	6

		Cases.
XV.	*Operations on Antrum and Frontal Sinus*— ..	34
XVI.	*Opthalmic Operations*—	
	Extraction of cataract	80
	Needling cataract	24
	Enucleation of Eyeball	44
	Iridectomy	2
	Meibomian Cysts	71
	Pterygium	48
	Lachrymal apparatus	23
XVII.	*Operations on affections of Bones*—	
	Osteomyelitis	13
	Sequestrotomy	7
XVIII.	*Dislocations*	3
XIX.	*Fractures of Bones*—Wiring Fractures ..	6
XX.	*Excision of Glands*—	
	Cervical	2
	Axillary	1
	Inguinal	30
XXI.	*Operations upon the Thyroid Gland*—	
	Exopthalmic Goitre	3
	Cyst Adenoma of Thyroid	7
XXII.	*Operations upon the Liver and Gall Bladder* ..	2
XXIII.	Incision of Abscess	34
	Saturing Wounds	12
	Removal of foreign bodies (bullets, needles, etc.)	6
	Examinations	6
	Scraping ulcers	4
	Dental extractions	6
	Excision of ganglion	8
	Excision of toe nails	66
	Excision of lipoma	8
	Excision of Keloid	2
	Excision of epulis	3
	Breaking down adhesions	15
	Skin graft	2
	Excision of Bursae	4
	Excision of Carbuncle	8
	Amputation of supernumerary digits ..	4
	Sebaceous Cysts	22
	Operation for Hare Lip	1
	Bronchoscopy	2
	Excision of Fibroma	14
	Cauterisation of warts, sinuses, etc. ..	15
	Excision of Bartholin Cysts	1
	Phrenicectomy	7
		3,359

Table VII.—Return showing the work done at the Venereal Diseases Clinic at the Public Hospital, Kingston, during the year 1933.

No. of Salvarsan Injections.	No. of Bismuth et Sodii Tart. Injections given.	Tartar Emetic Injections Given.	No. of Gonococcic Vaccines given.	No. of Individuals treated with Salvarsan.	No. of Treatments given for Venereal Diseases.	No. of Admissions to V.D. Wards.		No. of Discharges from V.D. Wards.		No. of cases dressed and irrigated.		No. of Operations performed.	No. of Prescriptions, Lotions, etc. dispensed.	
						Males.	Females	Males	Females.	Males.	Females.		Wards	O.Ps.
14,050	80	106	753	6,156	25,666	448	304	432	258	9,492	1,200	306	6,445	2,806

Table VIII.

No. of patients treated with tickets from authorized persons	1,757
No. of prescriptions for above	8,182
No. of casuality patients treated without tickets	150,300
No. of prescriptions for above	6,3781
No. of prescriptions for Constabulary	908
Motor Car Cases	477
Minor Operations	3,467
Eye, Ear, Nose and Throat	10,200

G. F. Baxter,
Acting Medical Superintendent, Public Hospital,
Kingston.

Table IX.—Statistical table of work performed at the Dental Clinic attached to the Public Hospital, Kingston.

No. of Patients attended	5,738
No. of Extractions	7,267
No. of Mouth Washes given (bottles)	152
No. of Treatments of Teeth	18
No. of Minor Operations	6
No. of Cleanings	6
Removal of Necrosed process	15

S. C. DePass
Surgeon Dentist, Public Hospital, Kingston

Table X.—*Radiology Department.*

No. of Patients X-Rayed from January 1st to December 31	2,293
No. of Films	4,246
No. of X-Ray exposures	6,500
No. of G. I. Series	197
No. of Gall Bladders	46
No. of Urinary systems	96
No. of Fractures	1,468
No. of Sinuses	189
No. of Treatments	7
Other Organs	297

C. F. H. Parkin,
Radiologist, Public Hospital, Kingston.

(B) *Report and Returns of the Visiting Surgeon, Jubilee Maternity Hospital.*

Admissions.—1,195 as against 1,222 of the previous year. Kingston contributed 951, St. Andrew 219, and the other parishes of the Colony 25.

Adult Deaths.—12.7 of the patients concerned were moribund on admission when medical aid was a negligible quantity thus increasing the death rate.

Deliveries.—1,165 infants were born, 601 being males and 564 females, made up as follows:—

1053 full term
33 premature
68 deaths (43 of these infants were macerated).
11 miscarriages.

Pupil Nurses.—16 admitted for training. 14 of these were granted certificates, 1 was dismissed for unseemly conduct and 1 failed to satisfy the examiners.

I would invite special attention to the very large increase of cases of Albuminuria and beg to express the hope that the prenatal clinic will soon be established to enable the staff to deal with this malady at an earlier stage of pregnancy that at present with the prospect of saving more lives.

The limitation of Bookings to 80% per month is largely responsible for the decrease in admissions, a large number of applicants having been refused as soon as this quota was reached.

Before concluding, it is my pleasure to record the Staff's appreciation of the visit on Christmas Day last of His Excellency the Governor, Lady Slater, Major and Mrs. Hallinan, and Mrs. Mellad, and our thanks to Lady Slater for having kindly presented the gifts to the patients. We are also grateful to Major and Mrs. Hallinan, Mrs. Bourne, Mr. Burke, Mr. Russell and Miss Walton for having been so good as to assist at the Nurses' Dinner.

Diseases and Complications affecting the Mother.

Abscess of breast	3	
Adherent Placenta	1	
Albuminuria	500	
Fever (puerperal)	3	
Hæmorrhage (accidental)	8	
Do. (post partum)	14	
Inertia	7	
Hydramnios	6	
Miscarriage	11	
Nephritis	1	(transferred from Public Hospital, Kingston.)
Placenta praevia	6	
Eclampsia	24	
Prolapse of Cord	2	
Tumour	3	
Vomiting (pernicious)	3	

Diseases and Deformities affecting the Infant.

Extra fingers	12
Extra toes	1
Opthalmia	6
Meningo-Encephalocele	1

Synopsis of Cases.

Vertex	1,128
Breech	21
Footling	6
Face	1
Transverse	2
Unreduced occipito-posterior	7
Total	1,165

Operations.

Application of Forceps	7
Craniotomy	1
Currettage	3
Perineorrhaphies	70
Venesection	6
Version	3

E. V. W. Mellad,
Visiting Surgeon, Jubilee Maternity Hospital.

(C) *Report and Returns of the Medical Superintendent, Lunatic Asylum.*

On the 31st December, 1933, there were 1,873 patients in the Asylum—918 males and 955 females; this number as compared with that resident on 31st December, 1932, viz., 1,856, reveals an increase in the insane population of 17 for the year, but the latter figure cannot be taken as indicative of the actual number of beds required for the treatment of patients as the following figures will disclose:—

The daily average number of patients resident during 1932 was 1,817, in 1933 it was 1,864, showing that the actual increase in the number for whom accommodation is required was 47 in the year. During September the daily average number reached its zenith—1876.06.

Admissions and Discharges.

During the year 542 patients were admitted—males 284, females 258, whilst 234 were discharged: males 118, females 116, those discharged being classified as follows:—

Recovered	118
Relieved	113
Not Improved	3

Three patients escaped, all being re-captured. One infant born in the Asylum was sent to the care of friends; five patients were sent to the Public Hospital for treatment, making a total number of 243 persons who left the Institution during the year.

The percentage of cases discharged "Recovered" based on the number admitted during the year was 21.77.

The percentage of cases discharged "Relieved" based on the number admitted during the year was 20.87. Most of those discharged "Relieved" have been in the Asylum before.

Death Rate.

282 persons died—males 146, females 135, and one infant born in the Institution, an increase of 96 as compared with the death rate of the year 1932; the percentage of deaths calculated on the daily average number of patients under treatment is therefore 15.18.

The principal causes of death were, males, Dementia Paralytica, Tuberculosis and Dysentery, whilst among females, Tuberculosis, Pneumonia and Dysentery. There were only 3 deaths due to Typhoid Fever though there were many mild cases of this disorder; in connection with the latter the regular prophylactic inoculation is without doubt proving efficacious.

Principal Type of Case admitted.

Maniac Depressive Psychosis predominated, especially of the Maniacal type among males, whilst several women were suffering from Melancholia. Primary Dementia was prominent among females. General Paralysis of the Insane appears to be increasing; 37 males and 4 females were on admission suffering from this disorder.

The principal causes of Insanity, in the order named, were Heredity, Syphilis, Epilepsy, Previous Attack. In five cases, a history of Ganja smoking was obtained. This latter is mentioned in order to show that the vice exists. Only ten cases could be traced to Alcohol.

Autopsies were conducted on the bodies of 45 males and 65 females; the value of Post Mortem Examinations cannot be too highly recommended. The assistance of the Rockefeller Foundation has been of enormous value in this branch of research, especially with regard to Tuberculosis. Dr. U. N. Murray and myself have observed marked macroscopic changes in the Thalamus in several cases who died from an Exhaustion Psychesis.

Wasserman Reactions were done on 210 male cases out of 278 admissions, 58 proving positive. In the Female Division 96 Wassermann Reactions were done out of 255 admissions; of these 27 proved positive.

Some research work is being carried out as to whether Dementia Paralytica can be caused by Yaws, but as yet there is not sufficient data at hand to enable a definite conclusion to be arrived at. Dr. U. N. Murray and Drs. Saunders and Turner of the Yaws Commission are co-operating in this work.

The assistance and co-operation of the Rockefeller Foundation in connection with Tuberculosis has been of great value. Routine intracutaneous tuberculin tests were carried out on newly admitted patients, 364 being tested; of these 333 re-acted positively to Tuberculin, while in 31 cases the results were negative. Of this group 15 received intracutaneous vaccination with heat killed tubercle baccilli, such vaccinations being intended to produce immunity against Tuberculosis. The other 16 negative reactions were kept as control cases.

On all cases not too excited and troublesome an X-Ray examination of the Thoracic Viscere was made, 335 examinations in all. All suspected cases in the Institution were also X-rayed, 12 cases of far advanced, and 13 cases of early invasion were thus diagnosed; 2 cases of pleural effusion were discovered.

91 pairs of lungs were obtained by Autopsy for research by X-ray and dissection. This work is being carried out in order to shed light on the Epidemiology of Tuberculosis in a Mental Hospital, to discover a possible relationship between Epilepsy and Tuberculosis, and lastly, to learn the fate in regard to Tuberculosis of susceptible patients admitted from rural districts.

It can also be reported that in as far as females are concerned, the number of active cases is definitely on the decrease, only 5 beds in the Female Division are now receiving special verandah treatment.

Of the Tropical or semi-Tropical disorders, Pellagra and Ankylostomiasis must be mentioned, the former as a direct cause of insanity and the latter as a contributing factor on account of exhaustion. Cases of Acute Pellagra are rare, but many patients suffer from the chronic form and eventually succumb to terminal intestinal trouble. It has been found that a diet containing a maximum of fresh vegetables, especially the pulses combined in acute cases with at least ½lb. of raw tomatoes keeps Pellagra in check.

In as far as the Lunacy Rate of the whole Colony is concerned, I have found, with the assistance of the Registrar General, that it is approximately 1.7 per 1,000. Such a rate can be considered as being low.

New Work, Repairs, Sanitation.

Now new buildings, either wards or store accommodation have been provided, with the result that wards are becoming more and more crowded. The general accommodation is quite inadequate, with the result that it is almost impossible to keep provisions and haberdashery in condition fit for issue.

With regard to deficient ward accommodation, at least 4 new wards are needed—2 male and 2 female. There is not sufficient sleeping space for patients, they have to sleep packed together, and several have to sleep on the floor owing to there being no space in which to put another bed.

Courtyards are overcrowded, the result being frequent fights and quarrels, which result in many minor casualties.

It is impossible under existing conditions to keep different types, especially the dangerous, apart from the more amenable and quiet patients. In one courtyard alone, there are at the Female Division by day over 200 refractory patients.

Latrine accommodation has not been increased, the result being that patients use ward gutters and even the courtyard as latrines. This doubles the work of the staff, and very often gets the latter into trouble though really they cannot be heavily censured because of aforesaid conditions.

In the Female Division, the roof of the verandah of "D" Ward has been re-conditioned and a new roof placed over the kitchen, while roofs in both Divisions have been patched.

One ancient latrine in the Male Division was modernized, five still require attention. A new absorption pit was constructed at the Annex. The Mortuary drain was diverted into an absorption pit, thus doing away with the offensive odour where it originally passed through wards near the male kitchen.

Extensive painting of ironwork throughout the institution if same is to be preserved and an enormous expense for repairs avoided in the near future is an urgent necessity.

Some minor repairs to buildings have been carried out; many roofs of wards still remain in need of repair.

The severe weather conditions prevailing from August onwards caused some material damage, the principal being the carrying away of the walls of two airing courts at the Female Division; this has been made good. Roads throughout the grounds and the fence along the north boundary were badly damaged, but have been repaired by means of patients' labour.

The death of a patient who occupied a private bungalow within the grounds solved the difficulty of accommodating resident Medical Officers, the bungalow in question becoming the residence of the Medical Superintendent, and the quarters originally occupied by the Medical Superintendent being allotted to the Second Assistant Medical Officer. The old condemned quarters occupied by the Fourth Assistant Medical Officer can now be demolished; it is unfit even for use as a store.

The water supply has on the whole, for domestic purposes, been adequate, but the pressure is always low, which in case of fire might lead to disaster. At the quarters of some officers situate at the end of a service the supply has been poor.

Farm and Ground.

The institution of gardens inside the wards, and more space throughout the grounds having been made use of for agricultural purposes has proved of considerable value, both from the standpoint of occupational therapy and economy. During the lean months of the year, the Asylum was able to eke out the necessary supply of vegetables when the Contractor was short. Approximately 7 tons of vegetables were furnished by the Asylum. It is anticipated that this quantity will be doubled in 1934.

The Poultry Farm has paid its way, egg production being double that of 1932; hatching has been satisfactory.

Sheep have done well, lambs have been plentiful and healthy.

The gross value derived from farm and gardening operations including manure and divi divi can be calculated as being £216 6s. 10d.for the year as aganst £227 1s. 10d. for 1932. Although the amount of garden produce provided by the Asylum in 1933 was greater than that in 1932, the difference in value is accounted for by the fact that for the purposes of comparison the estimated value is based proportionately on, in as far as possible, the prices paid for such articles purchased outside the Asylum, and the rates of such for 1933 were much lower in many instances than that for 1932. Of the £216 6s. 10d. the sum of £58 1s. 7d. goes to General Revenue, while £123 6s. represents the value of farm products used for dietary purposes thereby effecting a saving on Item 22. The balance, viz., £34 19s. 3d. goes to Patients' Fund in accordance with regulations governing that fund.

The following sums paid to the Asylum for work done were also collected:—

(a) For Laundry Work for the Public Hospital, Kingston ..	£105	7	8
(b) For making straw brooms for the Public Hospital, Kingston	2	4	4
(c) For making Floor Polish for the Public Hospital, Kingston	2	12	0

which amount of £2 12s. was refunded to Item 30—Washing and Sanitary Arrangements.

£47 18s. of the total sum of £105 7s. 8d. received for washing done for the Public Hospital, Kingston was also lodged to the credit of Miscellaneous Revenue, and the balance credited to Patients' Fund.

The Asylum manufactures straw brooms, brass polish and Fly Killer for itself, also all clothing and bedding, except blankets, for non-contributing patients, and all table (except spoons) and sanitary utensils for the same class.

The Workshops have most certainly proved their values, especially with regard to repair work, thereby relieving the Public Works Department of much time and labour and also effecting economy. Approximately 500 male and 450 female patients are employed in useful occupation. The Matron, Chief Attendant and Chief Artizan are again to be complimented on their efforts in connection with occupational therapy and the subordinate staff engaged in this branch of the work deserve praise. Mr. Robinson, Dispenser, has again been of great help.

Unfortunately, it has been found impossible to start a Cobbler's Shop, the reason being no cobblers and lack of funds to supply equipment and materials.

Board of Visitors.

The Board of Visitors met on six occasions during the year, one special meeting being held on 24th January, 1933, for the purpose of receiving a report from members visiting the Asylum at night to confirm the report of the Medical Superintendent as to overcrowding, and another on 6th June, 1933, relative to new works and improvements required in order of importance; consequent reports have been duly forwarded.

Two new members were appointed—the Honourable Major T. J. Hallinan, C.B.E., as Chairman, *vice* Dr. J. A. Henderson, Acting Superintending Medical Officer, and V. C. Alexander, Esq., *vice* Mrs. B. M. Wilson, retired.

The advent of the Honourable Major T. J. Hallinan, C.B.E., is very welcome because of his knowledge of Psychiatry and the needs of patients who are mentally deranged. Mr. V. C. Alexander also takes a keen interest in the working of the Institution.

Visits.

His Excellency the Governor and Lady Slater attended the Annual Sports on December 15th. Lady Slater graciously presented the prizes, and again on Xmas Day, when they made a tour of the wards much to the delight of patients and Staff.

The entry written by His Excellency in the Visitors Book consequent on these visits is most encouraging.

The Honourable Major T. J. Hallinan, C.B.E., Superintending Medical Officer has made several visits since his arrival in Jamaica.

Church Services.

Services for both Church of England and Roman Catholic patients have been held as usual. Patients belonging to other denominations would appreciate visits from pastors of their separate Churches. It would also be of value if Jewish patients were more frequently visited by a Rabbi.

Staff.

The Medical Superintendent was granted two months leave of absence and sailed from Jamaica on the 27th June, 1933. He, however, returned to Jamaica on 1st September, 1933, and resumed duties on the following day before the expiration of his leave on account of the Asylum suffering through storm and bad weather.

Dr. H. H. James again proceeded on six months leave of absence as from 30th October, 1933, this on account of ill-health.

Miss M. Grant, Assistant Matron, was granted leave of absence for seventeen weeks, but resumed duty four days before the expiration of this period in consequence of the illness of the Matron.

It must be mentioned that it is very difficult to arrange for the proper medical treatment of patients if Officers go on leave for long periods, e.g., if one officer goes on leave for six months and another officer is taken ill it is well nigh impossible to get necessary work done.

Mr. I. A. Jervis, Assistant Clerk, was on eight weeks vacation leave from 10th July, 1933.

Dr. U. N. Murray is to be congratulated on the hard work he has done, the keen interest he takes in clinical Psychiatry and general medicine, and for always being at hand when required.

Miss Tyler, Matron, has been indefatigable, and I wish to express my appreciation of her action when the disastrous flood rains occurred on the night of August 17th when she and the nurses on night duty set a fine example of devotion to duty in saving the frightened patients under their charge from the danger of flooded wards and compounds.

During the very bad weather which developed in the year, the nursing staff, both male and female, behaved well, many volunteering to remain for double hours on duty.

The Matron, Assistant Matron, the Chief Attendant, Mr. Wynter, Clerk and Purveyor, and Mr. Robinson, Dispenser, and all the office staff have been most helpful in assisting me in every branch of administration connected with the Asylum. Mr. Wynter and Mr. V. A. Isaacs are to be especially commended in this respect in view of the fact that during the latter part of the year there was no storekeeper or assistant storekeeper both having left the service on account of illness. Mr. Isaacs has also done good work as Secretary of the Combined Medical Service Cricket Club, while Mr. Robinson has been a tower of strength to the Thrift Club, which owing to his efforts and management as Treasurer is in a flourishing position.

Miss Bernice McFarlane, Storekeeper, was invalided from the Service on account of ill-health on 21st December, 1933. The Post of Storekeeper had not been filled by December 31st.

Miss Louise Bogle was appointed Assistant Storekeeper on the promotion of Miss McFarlane to Storekeeper from Assistant Storekeeper. She resigned on account of ill-health on 9th November, 1933. Her place was taken by Miss Lewling Goodison on 4th December, 1933, but she also resigned on account of ill-health on 21st December, 1933. The post of Assistant Storekeeper was finally filled by Miss Lillian Hutchinson being appointed thereto on six months probation.

The Staff Amusement Club had a very good annual entertainment; all members appreciated the presence of the Honourable Major Hallinan, Superintending Medical Officer, Mrs. Hallinan and other guests.

The usual course in training in Mental Nursing was carried out by the Medical Officers, Matron and Assistant Matron.

Four female nurses passed the Preliminary Examination and five the Final, whilst two male nurses and orderlies passed the Preliminary and five the Final.

The following members of the Nursing Staff left the Service:—

Males—

1 resigned on account of illness.
1 dismissed for gross insubordination.

Females—

Head Nurse resigned and post became redundant.
2 Junior Nurses also resigned.
1 Nurse absconded.
1 dismissed.
1 died.
1 transferred to Stores to act as Assistant Storekeeper on probation.

The Statutory Statistical Tables follow.

JAMAICA LUNATIC ASYLUM.

Population Return 1933.

	Males.	Females.	Total.	Males.	Females.	Total.
Remaining 1st January 1933 ..	..	..	..	905	951	1,856
Admitted during 1933 ..	278	255	533	..	..	..
Born 1933	1	1	2	..	..	..
Captured during 1933 ..	2	1	3	..	..	..
Returned from Public Hospital ..	3	1	4	284	258	542
Total under care 1933 ..	..	..	..	1,189	1,209	2,398
Discharged—recovered ..	68	50	118	..	..	..
" relieved ..	49	64	113	..	..	..
" not improved ..	1	2	3	..	..	..
Escaped	2	1	3	..	..	..
Infants died	..	1	1	..	..	..
Infants discharged	1	..	1	..	..	..
Patients died	146	135	281	..	..	..
Sent to Public Hospital for treatment	4	1	5			
Total discharged and died ..	..	..	..	271	254	525
Remaining 31st December, 1933 ..	..	..	..	918	955	1,873

R. W. DALE HEWSON,
Medical Superintendent.

Table I.—Showing the actual Admissions, Re-admissions, Discharges and Deaths during the Calendar Year ended 31st December, 1933.

	Males.	Females.	Total	Males.	Females.	Total.
In Asylum, 1st January, 1933	..	..	..	905	951	1,856
Cases admitted—						
First admissions ..	228	170	398		..	...
Not first admissions	50	85	135			
Captured ..	2	1	3			
Returned from Public Hospital	3	1	4			
Born	1	1	2			
Total cases admitted during the year	..	..	..	284	258	542
Total cases under care during the year		...	..	1,189	1,209	2,398
Cases discharged— ..						
Recovered ..	68	50	118			
Relieved ..	49	64	113			
Not improved ..	1	2	3			
Escaped ..	2	1	3		..	..
Died	146	135	281			
Sent to Public Hospital for surgical treatment	4	1	5			
Infants died ..	..	1	1	..	...	...
Infants discharged ..	1	...	1	..	..	..
Total discharged and died during year		...	...	271	254	525
Remaining in Asylum, 31st December, 1933	...	..	..	918	955	1,873
Average number resident during the year		..	...	917	947	1,864

Table IA.—Showing the number of previous attacks among those admitted during the Calendar Year, 1933, distinguishing those attacks that have been treated to recovery and discharged.

Number of previous attacks.	Having had previous attacks.					
	All attacks.			Attacks followed by Discharge or Recovery		
	Males.	Females.	Total.	Males.	Females.	Total.
Have had 1 previous attack ..	33	40	73	13	28	41
Have had 2 previous attacks ..	9	12	21	3	10	13
Have had 3 previous attacks ..	5	3	8	..	4	4
Have had 4 previous attacks ..	1	8	9	1	1	2
Have had more than 5 attacks ..	4	6	10	2	5	7
Unknown	..	16	16	..	1	1
	52	85	137	19	49	68

Table II.—Showing the Causes of Death among Male Patients during the Calendar Year, 1933, with the ages at Death.

——	Under 20	20 and under 30	30 and under 40	40 and under 50	50 and under 60	60 and under 70	70 and over	Total.
	M.	M.	M.	M.	M.	M.	M.	M.
Chronic Brain Disease	..	..	2	2	2	2	..	8
Cerebral Hæmorrhage	..	..	..	..	1	..	..	1
Maniacal Exhaustion	1	2	1	2	..	..	1	7
Sclerosis	..	..	..	..	..	..	..	..
General Paralysis	..	1	19	18	11	4	1	54
Dysentery	1	2	4	1	1	..	1	10
Intestinal Obstruction	..	..	..	..	..	..	..	..
Chronic Colitis	..	1	..	..	..	..	..	1
Pellagra	..	..	..	..	1	..	..	1
Syphilis	..	..	2	1	2	1	..	6
Pulmonary Tuberculosis	..	10	3	3	1	..	..	17
General Tuberculosis	..	2	4	4	..	..	..	10
Cerebral Abscess	..	..	..	..	..	..	..	..
Chronic Heart Disease	..	..	..	1	1	1	1	4
Diseases of the Urinary System	..	1	..	..	1	..	..	2
Appendicitis	..	..	..	..	..	..	..	..
Cancer of Stomach	..	..	..	..	..	..	..	..
Pneumonia	..	..	2	..	1	1	..	4
Typhoid	..	..	1	..	..	..	..	1
Senile Decay	..	..	..	..	3	4	7	14
Fracture of Skull	..	..	..	1	..	..	..	1
Chronic Bronchitis	..	..	1	..	..	..	..	1
Pulmonary Abscess	..	1	..	..	..	..	..	1
Acute Meningitis	..	2	..	..	1	..	..	3
								146

Table II.—Showing the Causes of Deaths among Female Patients during the Calendar Year, 1933, with the ages at Death.

——	Under 20	20 and under 30	30 and under 40	40 and under 50	50 and under 60	60 and under 70	70 and over.	Total.
	F.	F.	F.	F.	F.	F.	F.	F.
Chronic Brain Disease	..	..	..	2	..	1	..	3
Cerebral Haemorrhage	..	..	1	..	1	2	..	4
Maniacal Exhaustion	..	..	1	..	1	..	..	2
Cerebral Tumour	1	..	..	..	..	..	..	1
Epilepsy	..	..	..	..	..	..	..	..
Gen. Paralysis of the Insane	..	..	2	2	..	1	..	5
Dysentery	..	..	7	1	4	1	..	13
Enteric Fever	..	2	..	..	..	..	..	2
Pellagra	..	..	3	2	1	..	..	6
Pulmonary Tuberculosis	2	10	5	6	1	..	..	24
Tuberculosis, other forms	..	3	..	..	..	..	..	3
Syphilis	..	1	2	1	..	..	..	4
Pneumonia	1	4	1	8	7	1	1	23
Diseases of the Circulatory System	..	..	1	3	4	1	1	10
Diseases of the Respiratory System	1	..	..	..	..	1	..	2
Disease of the Urinary System	..	1	..	2	1	..	..	4
Tumour of Brain	..	..	..	..	..	..	..	..
Cirrhosis of Liver	..	..	..	..	1	..	..	1
Pernicious Anæmia	..	..	1	..	..	..	..	1
Meningitis	..	..	1	..	..	..	..	1
Senile Decay	..	..	..	..	..	5	10	15
Septicæmia	..	..	..	2	..	2	1	5
Infant of Premature Birth	..	..	..	..	..	..	..	..
Cerebral Abscess	..	..	..	1	..	..	..	1
Chronic Gastritis	1	..	..	..	..	..	..	1
Intestinal Obstruction	..	..	..	..	1	..	..	1
Cancer of the Stomach	..	..	..	..	1	..	..	1
Acute Peritonitis	..	..	1	..	..	..	..	1
Abscess of Lung	..	..	1	..	..	..	..	1
								136

Table III.—Showing the duration of the Disorder on Admission in the Admissions, Discharges and Deaths during the Calendar Year ended 31st December, 1933.

Class.	Admission.			Discharges. Recovered.			Discharges. Relieved or otherwise.			Deaths.		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
First Class—First attack, and within 3 months on admission	141	165	306	23	35	58	15	14	29	39	72	111
Second Class—First attack, above 3 and within 12 months on admission	49	20	69	17	1	18	9	4	13	55	18	73
Third Class—Not first attack, and within 12 months, etc.	52	30	82	8	2	10	21	33	54	17	15	32
Fourth Class—First attack or not, but of more than 12 months on admission	21	10	31	12	2	14	2	6	8	14	2	16
Fifth Class—Congenital	2	12	14	..	1	1	..	2	2	..	8	8
Unknown	13	18	31	8	9	16	4	5	9	21	21	42
Total	278	255	533	68	50	118	51	64	115	146	136	282

Table IV.—Showing the probable Causes of Insanity in the Patients admitted during the Calendar Year ended 31st December, 1933.

Cause of Insanity.	Number of instances in which each Cause was assigned. Number of Cases. Admissions—Males, 278, Females, 255—Total, 533. As predisposing Cause.			As exciting Cause.			As predisposing or exciting where these could not be distinguished.			Grand Total.		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Moral—												
Domestic trouble (including loss of relatives and friends)	..	..	..	..	..	..	..	..	..	..	..	..
Adverse circumstances (including business anxieties and pecuniary difficulties	..	..	..	..	..	..	..	..	..	..	..	..
Mental anxiety and worry (not including under above two heads) and over-work	15	..	15	..	..	..	..	..	..	15	..	15
Religious excitement	..	..	..	..	8	8	..	..	..	..	8	8
Love affairs (including seduction)	..	..	..	..	1	1	..	..	..	..	1	1
Physical—												
Intemperance in drink	10	..	10	..	1	1	..	..	..	10	1	11
Accident or Injury	..	..	..	..	..	..	..	..	..	..	..	..
Traumatism	..	..	..	..	..	..	..	..	..	..	..	..
Other bodily disease	..	..	..	..	..	..	..	..	..	..	..	..
Previous attacks	65	27	92	..	..	..	..	..	..	65	27	92
Heredity influence	48	50	98	..	..	..	..	..	..	48	50	98
Adolescence	..	13	13	..	..	..	..	..	..	..	13	13
Epilepsy	..	14	14	24	..	24	..	..	..	24	14	38
Puerperal	..	4	4	..	..	..	..	..	..	..	4	4
Syphilis	26	22	48	..	..	..	..	..	..	26	22	48
Not known	..	..	..	..	..	..	71	70	141	71	70	141
Senility	8	27	35	..	..	..	..	..	..	8	27	35
Menopause	..	8	8	..	..	..	..	..	..	..	8	8
Ganja Smoking	5	..	5	..	..	..	..	..	..	5	..	5
Puberty	..	10	10	..	..	..	..	..	..	..	10	10
Tubercular Disease	..	..	..	..	..	..	..	..	..	..	..	..
Venereal Disease	..	..	..	..	..	..	..	..	..	..	..	..
Fevers	..	..	..	..	..	..	..	..	..	..	..	..
Congenital defect ascertained	6	..	6	..	..	..	..	..	..	6	..	6
										278	255	533

TABLE V.—Showing the form of Mental Disorders in the Admissions, Recoveries and Deaths during the year and the form of Mental Disorders of the Inmates on 31st December, 1933.

Form of Mental Disorders.	Admissions.			Recoveries.			Deaths.			Remaining in Asylum.		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
I. Congenital Mental Deficiency	6	9	15	..	..	..	..	3	3	..	7	7
With Epilepsy	..	10	10	..	..	..	..	4	4	..	..	..
II. Insanity occurring later in life—												
Insanity with Epilepsy	15	10	25	..	..	..	..	4	4	52	49	101
General Paralysis of the Insane	37	4	41	..	..	..	26	4	30	44	2	46
Insanity with the grosser brain lesions	4	..	4	..	..	..	..	..	..	..	..	..
Acute Delirium (Acute Delirous Mania)	1	..	1	..	..	..	..	..	..	..	..	..
Confusional Insanity	23	6	29	21	4	25	..	1	1	..	..	..
Stupor	..	..	..	..	..	..	..	..	..	..	..	..
Primary Dementia	..	..	..	..	..	..	..	..	..	..	..	..
Mania—												
Recent	73	40	113	25	23	48	31	29	60	243	301	544
Chronic	12	10	22	..	..	..	48	32	80	291	145	436
Recurrent	54	36	90	20	4	24	..	6	6	88	100	188
Depressive Psychosis	3	..	3	..	..	..	..	..	..	..	..	..
Melancholia—												
Recent	3	16	19	..	2	2	..	8	8	8	20	28
Chronic	7	2	9	..	1	1	..	1	1	82	12	94
Recurrent	..	5	5	..	2	2	..	..	..	..	..	..
Alternating Insanity	..	20	20	..	10	10	..	9	9	69	40	109
Delusional Insanity	32	10	42	..	..	..	23	9	32	..	55	55
Systematised	..	..	..	..	..	..	..	..	..	..	..	..
Non-systematised	..	..	..	..	..	..	..	..	..	..	..	..
Volitional Insanity	..	..	..	..	..	..	..	..	..	..	..	..
Impulse	..	..	..	..	..	..	..	..	..	..	..	..
Obsession	..	..	..	..	..	..	..	..	..	..	..	..
Doubt	..	..	..	..	..	..	..	..	..	..	..	..
Moral Insanity	..	..	..	..	..	..	..	..	..	..	..	..
Dementia	..	..	..	..	..	..	..	15	15	..	..	..
Senile	8	15	23	2	..	2	18	9	27	30	131	161
Secondary or Terminal	..	5	5	..	..	..	..	1	1	..	..	..
Præcox	..	55	55	..	3	3	..	..	..	11	90	101
Neurosis—												
Neurasthenia	..	..	..	..	..	..	..	..	..	..	..	..
Anxiety Neurosis	..	1	1	..	..	..	..	1	1	..	..	..
Psychoneurosis—												
Hysteria	..	1	1	..	1	1	..	..	..	..	3	3
Psychasthenia	..	..	..	..	..	..	..	..	..	..	..	..
Toal	278	255	533	68	50	118	146	136	282	918	955	1873

Financial Statement.

Table VI.—Cost of Maintenance for the Calendar Year, 1933.

	£ s. d.
Salaries	5,454 0 5
Wages	16,217 6 10
Religious Services	60 0 0
Dietary	13,297 13 11
Uniform for Nurses and Servants	782 16 4
Furniture and Utensils	354 9 6
Clothing and Bedding	1,746 15 10
Drugs and Medical Appliances	319 11 11
Funeral Expenses	134 14 2
Travelling Expenses of Discharged Lunatics	72 18 7
Farm and Grounds and Repairs	348 11 4
Rent of Telephones	74 8 0
Washing and Sanitary Arrangements	350 11 3
Fuel and Lighting and Power	786 18 6
Water Rates	503 0 0
Miscellaneous	218 14 6
Stationery	..
	£40,722 11 1

Less Reimbursements.

Contributing Patients	£3,092 6 10	
Miscellaneous Revenue	105 19 7	3,198 6 5
Net cost to General Revenue		£37,524 4 8

Table VII.—Statement respecting Minor Funds of the Jamaica Lunatic Asylum, from 1st January to 31st December, 1933.

1.—Servants' Fine Fund.

	£ s. d.
Balance on 31st December, 1932	221 16 1
Receipts in 1933	20 2 11
	241 19 0
Expenditure in 1933	6 9 10
Amounts at Credit 31st December, 1933	£235 9 2

2.—Patients' Fund.

(Including the O'Loughlin Bequest.)

		£ s. d.
Balance on 31st December, 1932	£2,320 11 4¼	
Less	6 0 0	2,314 11 4¼
Receipts in 1933		221 1 7½
		2,535 12 11¾
Expenditure during 1933		167 19 0½
Amount at Credit 31st December, 1933		£2,367 13 11¼

Table VIII.—Shewing the Total Gross Cost, the Reimbursement-in-aid of Expenses incurred by the Government and the net Cost of Lunatic Asylum to General Revenue for each of the five years 1929-1930 and for the Calendar years ended 31st December, 1930, 1931, 1932 and 1933.

Year.	Total Gross Cost.	Reimbursements.		Total Reimbursements in-Aid.	Net Cost to General Revenue.
		Contributing Patients.	Miscellaneous Revenue.		
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1929-30 ..	46,643 5 3	3,126 12 6	114 13 2	3,241 5 8	43,401 9 7
1930 ..	47,146 9 10	2,847 2 3	90 5 2	2,937 7 5	44,209 2 5
1931 ..	45,116 19 4	3,000 4 5	104 10 4	3,104 14 9	42,012 4 7
1932 ..	42,868 8 5	2,904 2 9	124 14 6	3,028 17 3	39,839 11 2
1933 ..	40,722 11 1	3,092 6 10	105 19 7	3,198 6 5	37,524 4 8

TABLE IX.—A Return showing the General Financial Operations of the Lunatic Asylum for each of the years 1929-1930, and for the Calendar Years ended 31st December, 1930, 1931, 1932 and 1933.

Year.	Salaries and Religious Services.	Wages.	Dietary.	Uniform for Nurses and Servants.	Furniture and Utensils.	Clothing and Bedding.	Drugs and Medical Appliances.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1929-1930 ..	4,585 7 6	14,184 10 8	21,076 11 4	738 19 11	378 1 8	2,498 0 5	346 13 8
1930 ..	5,042 3 10	14,660 13 9	20,681 4 3	588 11 10	569 4 11	2,318 17 7	365 7 11
1931 ..	5,582 9 6	15,969 2 2	10,188 10 10	615 1 3	487 10 10	2,569 17 3	445 14 5
1932 ..	5,606 0 11	16,409 3 1	15,517 17 9	312 5 11	234 0 5	1,935 14 3	302 2 2
1933 ..	5,514 0 5	16,217 6 10	13,297 13 11	782 16 4	354 9 6	1,746 15 10	319 11 11

Year.	Funeral Expenses.	Travelling Expenses of Discharged Lunatics.	Farm and Grounds and Repairs.	Rent of Telephones.	Washing and Sanitary Arrangements.	Fuel Lighting and Power.	Water Rates.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1929-30 ..	99 17 1	98 11 10	395 16 3	81 7 6	539 13 4	776 2 7	503 0 0
1930 ..	106 13 3	81 18 1	509 7 0	94 2 0	579 14 10	784 17 2	403 0 0
1931 ..	161 10 5	75 1 2	346 7 1	96 0 6	520 0 10	1,051 1 6	603 0 0
1932 ..	103 14 6	90 18 7	297 7 6	93 18 0	363 16 1	880 16 10	503 0 0
1933 ..	134 14 2	72 18 7	348 11 4	74 8 0	350 11 3	786 18 6	503 0 0

Year.	Miscellaneous.	Stationery.	Electric Fans.	Purchase of Typewriting Machine.	Installation Telephones.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1929-30	292 14 3	38 17 3	9 0 0	..	..
1930	322 6 9	38 6 8	..	..	..
1931	329 1 11	46 12 6	8 13 0	21 4 2	..
1932	209 9 5	8 3 0	..	..	..
1933	218 14 6	..	..	..	..

R. W. DALE HEWSON,
Medical Superintendent Lunatic Asylum

(D) Return of Diseases and Deaths in the Public General Hospitals (outside Kingston) during 1933.

Diseases.	Cases.	Deaths.	Out-patients.
Chicken Pox	11	..	23
Diphtheria	3	1	1
Dysentery—Amœbic	26	2	28
Bacillary	22	1	15
Unclassified	7	..	9
Erysipelas	9	..	11
Enteric Fevers	406	164	65
Gonococcal Infections	824	4	2,566
Influenza	85	1	743
Leprosy	..	..	1
Malaria—Tertian, Quartan, Sub-Tertian, Chronic	4,530	143	10,083
Blackwater	6	3	..
Measles	21	..	82
Poliomyelitis	3	1	3
Encephalitis Lethargica	3	..	..
Mumps	7	..	12
Scarlet Fever	1	1	..
Soft Chancre	27	..	128
Syphilis—Primary	144	..	1,041
Secondary	125	5	828
Tertiary	324	13	2,489
Congenital	26	4	260
Unclassified	81	2	1,274
Septicæmia	217	11	..
Tetanus	30	14	2
Tuberculosis—Pulmonary	85	18	312
Other Forms	102	11	95
Whooping Cough	..	1	74
Yaws	26	..	2,249
Alcoholism	8	1	6
Anæmias	45	13	415
Diabetes	36	8	8
Pellagra	3	..	7
Scurvy	..	..	1
Rheumatism—Acute	99	1	1,496
Chronic	107	..	1,178
Rickets	2	..	37
Tumours—Malignant	168	23	259
Non-malignant	79	2	83
Diseases Ductless Glands	13	2	22
Nervous System	396	49	1,332
Eye	228	..	1,082
Ear	35	1	210
Circulatory System	342	59	819
Lymphatic System	160	1	435
Respiratory System	899	150	2,899
Digestive System	1,842	139	8,860
Spleen	4	1	6
Breast	93	..	309
Parasites	235	3	864
Diseases Genito-Urinary System (non-venereal)	2,006	96	4,686
Puerperal State	620	88	770
Skin and Cellular Tissues	1,096	19	6,769
Bones and Organs of Locomotion	300	6	539
Malformations	5	1	2
Diseases of Infancy	17	5	79
Diseases of Old age	9	..	116
Poisons	6	..	3
Diseases produced by external causes	2,978	82	7,965
Ill-defined diseases	74	6	134
Other General Diseases	33	1	49
No disease	59	..	58
Total	19,149	1,156	63,892

(E) Return of Surgical Operations, Public General Hospitals (excluding Kingston) 1933.

Major Operations.

	Number.
Operations on Upper Extremity—	
Ligature of arteries—Large	14
Dislocations (operations—open)—	
Finger	1
Elbow	2
Shoulder	2
Amputations—	
Arm	9
Fore-quarter Amputation	2
Excision of Elbow Joint	1
Excision of Shoulder Joint	1
Operations on Head—	
Removal of Dermoid Cysts	3
Epithelioma and Rodent Ulcers	1
Sarcoma of Skull	1
Operations on Skull and Brain—	
Compound Depressed Fractures	9
Simple Localised Depressed Fractures	6
Trephining for pus inside skull	1
Decompression	2
Operations on Eye—	
Cataracts	18
Enucleation	30
Other operations	2
Operations on Throat and Nose—	
Resection of Septum	4
Antrum	14
Operations on the Ears—	
Mastoid	9
Operations on the Face—	
Operative Treatment of Rodent Ulcer	2
Plastic Operations	1
Hare-Lip	1
Operations of Mouth—	
Tumours of Tongue	2
Tumours of Jaws	3
Cleft Palate	1
Fracture of Jaw, wiring	1
Operations on the Thyroid Gland—	
Removal of part and whole of the Gland	2
Operations for removal of Glands in Neck—	
Tuberculous Glands	15
Other Operations	2
Operations on Œsophagus—	
Ligature of the Arteries of the Head and Neck	2
Operations on Thorax—Removal of Breast—	
Radical amputation with removal of Axillary Glands complete	12
Diathermy	1
Resection of Ribs—	
Partial for drainage of Empyema	5
Disease of Bone	1
Removal of Foreign Bodies from chest or lungs and throat	1
Operations on the Abdomen—	
Operations on Strangulated Femoral Hernia	3
Operations on Strangulated Inguinal Hernia	32
Operations on Strangulated Umbilical Hernia	4
Operations for Oblique Inguinal Hernia (Radical cure)	113
Operations for Femoral Hernia (radical cure)	8
Appendicectomy	412
Laparotomy	82
Splenectomy	2
Operations on Bowel—Resection	10
Volvulus	7
Intersusceptum	3
Colostomy	3
Enterostomy	1
Other operations	6

	Number.
Operations on the Stomach—	
Perforation of Duodenal Ulcer	1
Partial Gastrectomy	2
Gastro-enterostomy	18
Obstruction of Pylorus (Congenital or acquired)	1
Operations for wounds of Abdomen and Diaphragm	1
Operations on Bladder—	
Removal of Growths from the bladder	1
Lithoplaxy	1
Prostatectomy	15
Operations on the Ovary and Appendages—	
Oöphorectomy	36
Salpingectomy	83
Hysterectomy	53
Pan Hysterectomy	17
Myomectomy	5
Removal of malignant inoperable growth of cervix (Surgical Diathermy)	3
Cæsarean Hysterectomy	1
Ruptured Ectopic	1
Other operations	3
Ventro fixation—	
Shortening of round ligaments	9
Removal of Ovarian Cysts	7
Uterine suspension	1
Gillion's operation	1
Repair or Amputation of Cervix	8
Repair of Vesico-vaginal Fistula	5
Repair of Recto-vesical Fistula	1
Anterior and Posterior Colporrhaphy	10
Cervix-uteri polyp	5
Obstetrical—	
Ectopic Gestation	17
Fleshy Mole	1
Hydatid Mole	2
Forceps Delivery	43
Removal of Lithcopedian	1
Perineorrhaphy	2
Craniotomy	2
Cæsarean Section	4
Other Operations	8
Operations Liver and Gall Bladder—	
Thalma-Morrison	1
Cholecystectomy	9
Cholecystotomy	1
Drainage of Gall Bladder	2
Genito-Urinary—	
External Urethrotomy	3
Amputation of Penis (partial or complete)	6
Other operations	3
Hydrocele—Radical Cure	2
Operations on Vertebral Column—	
Laminectomy	1
Cervical Vertebrae	1
Operations on Anus and Rectum—	
Hæmorrhoids (resection)	19
Dilation of Stricture	3
Operations on Lower Extremity—	
Amputations of leg	32
Amputations of thigh	4
Sarcoma of thigh	1
Excisions—	
Knee Joint	4
Hip Joint	1
Fractures—open operations—	
Toes	–
Metatarsal Bones	[illegible]
Tibia and Fibula	[illegible]
Patella	–
Femur	[illegible]
Nasal Bones	[illegible]
Carpals	–
Radius and Ulna	–

	Number.
Miscellaneous—	
Tendon grafting	10
Operations for loose semi-lunar cartilages and other form of derangement of knee joint ..	6
Bone grafting	9
Operations for disease of the bones ..	51
Treatment of Varicose veins (other than injections)	5
Ostectomy	30
Talipes and other deformities	1
Operations on Nerves	2
Aneurysm—Ligature of	1
Cancer—skin—removal	2
Removal of foreign bodies	4
Total ..	1,591
Minor Operations.	
Amputations—	
Fingers	65
Thumbs	12
Forearm	9
Dislocation—Simple reductions—	
Finger	5
Wrist	14
Elbow	16
Shoulder	31
Clavicle	17
Jaw	4
Fractures—Simple reductions—	
Finger	14
Metacarpals	6
Carpals	1
Radius and Ulna	208
Elbow joint	26
Tumerus	24
Jaw	1
Rib	4
Clavicle	5
Spine	1
Operations on Head—	
Treatment of Scalp wounds	136
Removal of innocent tumours	18
Removal of Cysts	3
Operations on Eye—	
Foreign bodies	15
Ptyrigia	13
Iridectomy	4
Meibomian Cysts	3
Lachrymal Duct dilation	4
Other	1
Operations on Throat and Nose—	
Polyp	16
Tonsils	297
Adenoids	70
Foreign bodies	27
Quinsy	2
Enlarged turbinates	4
Operations on the Ears—	
Boils	6
Foreign bodies	20
Removal of Cysts	2
Incision of Tympanic Membrane	1
Operations of the Mouth—	
Wounds of tongue	2
Ranula	13
Extraction of teeth	2,778
Operations on Neck—	
Tracheotomy	1
Tuberculous glands—removal of	3
Innocent Tumours—removal of	3
Operations on the Œsophagus—	
Passing Œsophagial Bougles	2
Operations on Thorax—	
Breasts—Partial amputation for innocent growths and cysts	4
Paracentesis of chest	31

	Number.
Operations on the Abdomen—	
Operations for Umbilical Hernia (radical cure)	4
Operations for Ventral hernia (radical cure)	2
Paracentesis Abdomen	66
Reducing Hernia	1
Operations on Upper Extremity—	
Ligature of Arteries—Small	16
Operations on the Bladder—	
Supra Pubic Cystostomy	35
Other operations	24
Operations on the Ovary and Appendages—	
Dilation and curettage	240
Cervix—cauterisation	2
Cervix—removal of polyp	1
Removal of Bartholin Cysts	9
Obstetrical—	
Induction of labour	29
Removal of macerated Foetus	8
Perineorraphy	6
Retained placenta	3
Genito-Urinary—	
Operations on Penis and Urethra Dilatation	262
Internal Urethrotomy	1
Circumcision	305
Phimosis—reduction	7
Cystotomy	2
Operations on Testicles—	
Hydrocele	69
Varicocele	1
Orchidectomy	7
Orchidopexy	1
Spermatocele	1
Operations on Vertebral Column—	
Tapping the spinal Theca	20
Spinal Analgesia	15
Operations on Anus and Rectum—	
Ischio-rectal Abscess	13
Fistula and sinuses	22
Fissure	4
Operations on Lower Extremity—	
Amputations—Toes	58
Foot	5
Dislocations (simple reduction)—	
Toes	8
Ankle	5
Knee	2
Hip	5
Fractures (simple reduction)—	
Matatarsal bones	8
Tarsal bones	1
Tibia and Fibula	56
Femur	75
Pelvic bones	1
Miscellaneous—	
Cysts—removal of	18
Abscesses and cellulitis—incisions	1,172
Skin grafting	26
Treatment of Ingrowing toe-nail	60
Tenotomy	28
Surturing of muscles, suturing of wounds and tendons	644
Inguinal glands—removal of	126
Diathermy	4
Foreign bodies—removal of	24
Adhesions, breaking down	24
Cystoscopic Exams	4
Other operations	98
Ulcers, Carbuncles and other abscesses— scraping of	167
Aspiration of joints	7
Varicose veins—injections	13
Necrosed tissue—removal of	5
Total	7,762

(F) *Report and Returns of the Medical Attendant to the Lepers' Home.*

	Males.	Females.	Total.
No. of patients remaining at 31.12.32 ..	70	58	128
" " admitted during the year	13	9	22
" " discharged in 1933 ..	10	4	14
" " absconded in 1933 ..	2	1	3
" " died in 1933	8	6	14
" " remaining at 31.12.33 ..	63	56	119
Death rate 9.3 per centum.			
Daily average for the year	64	56	120
Longest period any one inmate remained in the home	52 years	10 months.	

	Males.	Females.	Total
Inmates under 15 years at 31.12.33	1	4	5
Average stay of those discharged ..	9 months	6 months	
Average stay of those who died ..	4 years	18 years	
Average stay of those remaining at 31.12.33	13 years	9 years.	

Staff and Accommodation.—Remains the same as in previous years. Inmates who are able and willing continue to be employed in various services.

Condition of Buildings and Grounds.—The Public Works Department have been doing repairs to buildings and fences. I hope to have more done during the new year.

The grounds are in good order.

Sanitary Arrangements.—Dry earth bucket system. The contents are disposed of daily in the Farm.

Drainage.—The open surface concrete drains are in need of repairs.

Water Supply.—The Spanish Town Water Supply, the quality fair, pressure low.

Dietary.—As approved of by His Excellency the Governor.

My sincere thanks are due to the many friends who continue the supply of reading matter and games.

Religious ministrations has been regularly carried out by the Church of England, Roman Catholic, Salvation Army and Seventh Day Adventists.

As I was not in charge during the period under review, I am not in a position to make any observations or comments on the effects of treatment.

A. A. Anderson,
Medical Attendant.

VI.—PRISONS.

Reports of the Medical Officers of Prisons.

General Penitentiary, Kingston.

There were 1,244 prisoners admitted during the year, of whom 26 were in feeble health. There were 1,245 prisoners discharged, of whom 12 were in feeble health.

During the period there were 6 deaths.

Among the members of the Staff, there were 430 cases of illness during the year. The gereral health of the prisoners was good.

The Sanitary condition was satisfactory.

Recommendations made during the year were for sheds over the compounds immediately behind the Surgeon's Office and the Dental Surgery, and for outlet drains for terrace in the hospital compound, none of which have been done.

Return of Medical Statistics for the General Penitentiary, Kingston, during year ended 31st December, 1933.

Number of prisoners in custody 1.1.33	704
Admitted during the year	1,244
Discharged during the year	1,245
Greatest number in custody on any one day ..	746
Daily average in custody	707
Removal on Medical grounds	2
Removed to Lunatic Asylum	6
Deaths	6
Greatest number in Hospital on any one day ..	79
Daily average in Hospital	55
Number of sick treated outside Hospital	9,237
Major operations performed	4
Minor operations performed	70
Transferred to Public Hospital for Major operations	4
Vaccinations performed	613
Salvarsan Injections	302
Antimony Tartrate Injections	17
Quinine Injections	26

R. H. Davidson,
Medical Officer.

St. Catherine District Prison.

State of Prison.—The general sanitary condition of the wards, hospital, officers' quarters and compound was kept up to a highly satisfactory standard.

Health of Prisoners.—The total number of admission to Hospital during the year was 639. Of these 274 were cases of malaria. Six deaths from natural causes occurred among the prisoners:—1 typhoid fever, 1 diabetes mellitus, 1 tertiary syphilis, 3 pneumonia. The typhoid case was admitted to hospital 14 days after he was admitted into prison. It is more than likely that he contracted his infection outside the prison. Two executions by hanging were carried out in accordance with the provisions of the Law.

Health of Officers.—69 officers were treated during the year. One of the younger officers died after an attack of pernicious anæmia, which ran a rather rapid course.

No improvement was carried out in building operations to affect in any way the Sanitary or Medical situation.

Return showing the following for the year ended 31st December, 1933.

Mortality from Execution 2, from natural causes 6	.. ..	8
Insanity		4
Removal on Medical grounds		Nil
Suicide		Nil
Cases treated among prisoners in hospital ..		639
Number in custody 31st December, 1933		688
Received into prison during 1933		3,785
Daily average in custody during 1933		594
Death per 1,000 calculated on the daily average during 1933		10.101
Cases treated in prison during 1933		1,441
Greatest number in custody any one day during 1933		688
Discharged during the year 1933		3,688
Number of Officers treated in the prison during 1933 ..		69
Number of prisoners received in feeble health during 1933		37
Number of prisoners discharged in feeble health during 1933		41
Daily average of sick in hospital during 1933 ..		20.747
Daily average of sick treated outside hospital during 1933		70
Greatest number of sick in hospital any one day during 1933		41
Greatest number of sick treated outside hospital any one day during 1933		163
Number of cases treated outside hospital during 1933		802

H. H. Blair,
Surgeon.

Government Industrial School, Stony Hill.

There were 1,068 cases treated in hospital during the year, 16 of these being carried forward from the previous year thus leaving 1,052 new cases. 1,017 cases were discharged cured. There were 3 mortalities as follows:—

1 from Cerebral Hœmorrhage,
1 from Pulmonary Tuberculosis,
1 from Pott's Disease.

There were 32 patients in hospital on 31.12.33.

The diseases most prevalent were:—

Influenza	372 cases
Ulcers	93 "
Wounds	55 "
Acute Indigestion ..	97 "
Yaws	29 "

103 inmates were treated for Intestinal Parasites.

16 Minor Operations were performed.

Aside from the epidemic of Influenza in February, the general health has been very good.

S. C. Grant,
Medical Officer.

RETURN OF DISEASES.

Diseases.	General Penitentiary.			St. Catherine District Prison.			Industrial School, Stony Hill.		
	In-patients.	Deaths.	Out-patients.	In-patients.	Deaths.	Out-patients.	In-patients.	Deaths.	Out-patients.
Enteric Fever	..	..	..	2	1	..	..	..	..
Malaria	176	..	281	274	..	110	3	..	..
Yaws	1	..	4	4	..	15	18	..	..
Tuberculosis Pulmonary ..	6	1	..	..	..	..	1	1	..
Do. of other organs ..	5	..	..	..	..	..	1	1	..
Influenza	176	..	..	34	..	1	350	..	..
Measles	..	..	..	11	..	..	1	..	..
Soft Chancre	..	..	..	5	..	27	..	..	..
Diabetes	..	..	..	1	1	..	..	..	..
Syphilis	14	1	165	13	1	6	..	..	..
Gonorrhoea	6	..	116	2	..	51	..	..	..
Septicæmia	1	1	..	..	..	..	..	..	..
Cancer	2	..	..	..	..	1	..	..	..
Rheumatism Ante Chronic ..	10	..	134	2	..	7	2	..	..
" Chronic ..	1	..	..	..	..	..	..	..	..
Scurvy — ..	..	..	2	..	..	..	..	..	..
Pellagra	1	..	..	..	..	..	..	..	..
Anæmia	5	..	126	23	..	10	2	..	..
Ankylostomiasis	6	..	..	5	..	6	101	..	..
Appendicitis	2	..	..	2	..	..	1	..	..
Hernia	3	..	34	4	..	17	1	..	..
Affectations of Nervous System ..	38	..	481	15	..	33	35	1	..
" Circulatory System ..	30	..	133	31	..	19	12	..	..
" Respiratory System ..	41	3	235	25	3	12	28	..	..
" Skin and Cell Tissues ..	80	..	1,733	73	..	185	127	..	..
Diseases of Digestive System ..	123	..	3,230	43	..	123	128	..	..
" Genito-Urinary System ..	18	..	1,175	27	..	20	15	..	..
" Puerperal State ..	2	..	..	..	..	..	..	..	..
" Bones and Organs of Locomotion ..	1	..	198	..	..	1	2	..	..
Affectations produced by External Causes	92	..	1,120	27	* 2	144	97	..	..
Ill-defined diseases ..	47	..	70	15	..	14	4	..	..
Diseases of Old Age ..	..	..	..	1	..	..	..	..	..
	887	6	9,237	639	8	802	929	3	..

*Executions.

VII.—SCIENTIFIC.

Report of the Bacteriological and Pathological Laboratory.

Administration.—The Laboratory Staff consisted of:—
The Bacteriologist and Pathologist
5 Laboratory Assistants (1 paid by K.S.A.C.).
1 Clerical Assistant.
2 Washers and Cleaners.
New members of the staff are Messrs. W. Fitz-Ritson, A. Harry, H. C. Berry and E. Miller.
Laboratory fees totalled £181 2s. as against £148 15s. in 1932, and £166 13s. in 1931.

GENERAL.

Vaccine Preparation.—Typhoid vaccine demand increased greatly during the year,—25,880 cc. being prepared for distribution as compared with 16,560cc during 1932. Autogenous Vaccines were prepared on request.

Serology.—Both the Kahn Precipitation Test and the Wassermann Reaction were done during the year. The results show that the Kahn is the reaction of choice. There has been a decrease of 1,879 specimens examined for Syphilis. This—the only decrease in the work of this Laboratory—is probably due to the activity of the Yaws Commission Laboratory.

Enteric group agglutination tests have increased from 825 in 1932 to 1477 in 1933. Both the macroscopic live culture and the Dreyer's formalized culture methods were used. The latter gives more constant results.

Titration of sera from nurses and re-vaccination were carried out during the latter half of the year.

Equipment.—There was little money available for new equipment. The only addition being a "Kenrik" portable Basal Metabolism outfit. A Card Index Filing System was installed and is giving much simpler results than the previous book record system.

Research.—There has been little time for research during 1933. Some 400 Yaws sera were examined with the Kahn Precipitation Test.

108 appendices, removed in the Hospital, were examined bacteriologically, culturally and histologically. It is of interest to note that a large number of these—over 25%—contained Amœba histolytica.

Table I.—Origin of all Specimens.

	1929.	1930.	1931.	1932.	1933.
Kingston Public Hospital	7,130	6,406	7,433	9,061	10,099
Mental Hospital	182	568	687	701	601
Other Institutions	970	445	182	1,181	1,926
Country Medical Districts	957	942	708	875	1,018
Health Officers	..	..	..	175	739
Private Practitioners	519	509	907	642	716
	9,758	8,870	9,917	12,635	15,099

Table II.—Distribution of Specimens.

	1929.	1930.	1931.	1932.	1933.
Autogenous Vaccines	..	..	157	46	61
Autopsies ..	92	113	103	118	114
Blood Examinations—					
Counts ..	38	96	188	202	251
Cultures ..	2	5	6	15	14
Parasites ..	67	82	141	86	280
Sugars ..	3	56	146	308	517
Ureas ..	3	4	10	16	38
Examination of Fæces—					
Helminths ..	497	737	793	620	691
Amœbæ ..	18	58	47	99	388
B. dysenteriae	..	26	6	110	116
Miscellaneous ..	7	..	..	44	59
Examinations for Gonococci	68	51	85	90	151
Examinations for Tuberculosis	340	478	337	375	422
Medico-legal Examinations	22	64	99	162	121
Morbid Histology	61	55	63	77	85
Persons Vaccinated	..	..	..	..	139
Serology of Syphilis	4,302	4,466	6,201	7,489	5,610
Serology of Enteric Diseases	758	497	538	825	1,477
Gastric Analyses ..	4	5	3	11	16
Throat Swabs ..	22	12	13	81	102
Typhoid Vaccine Prepared	..	..	..	828	1,294
Unclassified Examinations	22	26	16	126	204
Urinalyses ..	3,386	1,962	940	1,293	2,275
Water Examinations	256	234	199	362	664

Table III.

Nature of Test.		Kingston Public Hospital.	Mental Hospital.	Other Institutions.	Country Medical Districts.	Health Officers.	Private Practitioners.	Total.
Autogenous Vaccines (B. coll, Staphylococcus M. catarrhalis, etc.)	..	61	..	..	..	..	..	61
Blood Examinations—								
Counts	..	187	8	1	6	..	49	251
Cultures	..	10	..	..	..	..	4	14
Malarial Parasites	+	57	5	..	..	1	8	71
" "	−	121	17	1	7	2	61	209
Sugars	..	483	1	..	3	..	30	517
Ureas	..	32	..	..	..	..	6	38
Fæces—								
Ankylostome	+	49	48	13	21	1	3	135
Ascaris	+	6	17	3	2	..	4	32
Trichocephalus	+	33	63	7	7	1	4	115
Helminths	−	171	140	28	34	3	33	409
Amœbæ	+	116	29	1	4	..	29	179
"	−	99	74	..	5	..	31	209
B. dysenteriæ	+	3	14	..	2	..	2	21
"	..	3	82	..	..	..	10	95
Miscellaneous	..	35	..	..	2	11	11	59
Gonococci—								
Gonococci	+	20	..	..	3	..	12	35
"	−	53	..	..	8	2	22	85
Gram-neg. diplococci	+	22	..	1	2	..	6	31
B. tuberculosis—								
B. tuberculosis	+	26	1	5	43	..	12	87
"	−	190	14	14	95	3	19	335
Medico-legal —								
Blood	+	..	..	..	..	..	..	72
"	−	..	..	..	..	..	..	25
Semen	+	..	..	..	..	..	..	11
"	−	..	..	..	..	..	..	13
Morbid Histology	..	36	5	..	32	1	11	85
Serology								
Kahn Precipitation—								
	+	1,117	7	235	59	2	36	1,456
	−	1,293	6	206	60	1	66	1,632
Doubtful	+	20	..	1	5	..	2	28
Wassermann—								
	+	782	..	7	43	1	20	853
	−	1,300	..	90	83	1	81	1,555
Doubtful	+	65	..	3	4	..	2	74
Spinal Fluid	..	11	..	..	..	..	1	12
Widal—								
B. typhosus	+	354	28	..	218	7	35	642
	−	524	22	1	240	6	36	829
B. paratyphosus A	+	1	..	..	..	..	..	1
	−	1	..	..	..	..	2	3
B. paratyphosus B	+	1	..	..	..	..	..	1
	−	1	..	..	..	..	..	1
Stomach Contents—								
Test Meal	..	12	..	..	3	1	..	16
Throat Swabs—								
B. diphtheriæ	+	20	..	..	3	1	1	25
	−	37	1	..	2	12	2	54
Vincent's Angina	+	8	..	..	1	3	2	14
Streptococci	+	6	..	..	1	..	2	9
Typhoid Vaccine—								
20cc bottles	..	..	..	..	..	..	..	1,294
Persons vaccinated	..	139	..	..	..	..	..	139
Unclassified	..	144	9	9	11	1	30	204

Table III, *contd.*

Nature of Test.	Kingston Public Hospital.	Mental Hospital.	Other Institutions	Country Medical Districts.	Health Officers.	Private Practitioners.	Total.
Urinalysis—							
Qualitative	1,503	..	6	6	2	31	1,548
Quantitative	136	..	..	..	..	1	137
Bacteriological—							
Cultural	130	..	..	3	..	11	144
Gonococci +	5	..	..	..	..	..	5
−	34	..	..	..	..	..	34
Gram-neg. diplos +	12	..	..	..	..	..	12
T. B. +	2	..	..	..	..	..	2
−	10	..	..	..	..	..	10
Steph. & B. coli +	303	..	..	..	..	..	303
Bacteria	80	..	..	..	..	..	80
Water Eaminations—				K.&S.T.A.			
Filtered:							
Positive	..	..	49	..	..	..	49
Doubtful	..	..	134	..	1	..	135
Negative	..	..	5	..	..	..	5
Filtered Chlorinated:							
Positive	..	..	..	..	16	..	16
Doubtful	..	..	144	..	15	..	159
Negative	..	..	48	..	..	..	48
Unfiltered:							
Positive	..	..	66	..	31	..	97
Doubtful	..	..	30	..	21	..	51
Negative	..	..	8	..	..	..	8
Unfiltered Chlorinated							
Positive	..	..	4	..	..	..	4
Doubtful	..	..	34	..	..	..	34
Negative	..	..	58	..	..	..	58

Table IV.

Causes of Death.	Ordered for Coroner.	Requested by M.O.'s of Hosp.	Total.
General Diseases—			
(1) Syphilis	..	4	4
(2) Blackwater Fever	..	1	1
(3) Malaria Fever	..	3	3
(4) Enteric Fever	..	3	3
(5) Septicæmia	1	..	1
(6) Miliary Tuberculosis	..	1	1
	1	12	13
Injuries—			
(1) Asphyxiation	..	1	1
(2) Burns, Shock and Sepsis	6	..	6
(3) Fracture of long bones	6	..	6
(4) Fracture of Skull	10		10
(5) Fracture of Ribs	3	..	3
(6) Fracture of Pelvic Bone	1	..	1
(7) Laceration of Intestine	1	..	1
(8) Laceration of Liver	3	..	3
(9) Laceration of Kidney	1	..	1
(10) Laceration of Arteries and Veins	3	..	3
(11) Poisoning, (Carbolic 1; Arsenic 3;)	4	..	4
(12) Cuthroat—Suicidal	1	..	1
(13) Wound of Heart	1	..	1
(14) Bullet wound of Brain	1	..	1
	41	1	42

Table IV, *contd.*

Causes of Death.	Ordered for Coroner.	Requested by M.O.'s of Hosp.	Total.
Diseases of the Brain and Meninges—			
(1) Cerebral Tumour ..	..	1	1
(2) Cerebral Softening (Syphilitic)	..	2	2
(3) Cerebral Haemorrhage ..	1	1	2
(4) Cerebro-spinal Meningitis ..	..	5	5
	1	9	10
Diseases of Circulatory System—			
(1) Aneurysm of Aorta ..	..	2	2
(2) Pericarditis	2	3	5
(3) Coronary Artery Occlusion	1	2	3
	3	7	10
Diseases of the Respiratory System—			
(1) Lung Abscess ..	3	..	3
(2) Pulmonary Tuberculosis ..	..	1	1
(3) Lobar Pneumonia ..	..	4	4
(4) Broncho-pneumonia ..	..	2	2
(5) Pulmonary Oedema ..	..	2	2
(6) Pleurisy c Effusion ..	..	1	1
	3	10	13
Diseases of the Excretory System—			
(1) Acute Nephritis ..	1	1	2
(2) Chronic Nephritis ..	..	3	3
(3) Uraemia	..	5	5
	1	9	10
Diseases of the Digestive System—			
(1) Gastro-Enteritis ..	...	3	3
(2) Chronic Constipation ..	...	1	1
(3) Gastric Ulcer ..	..	1	1
(4) Duodenal Ulcer ..	..	1	1
(5) Peritonitis ..	..	3	3
(6) Volvulus	1	1	2
(7) Ascariasis ..	..	2	2
(8) Vomiting Sickness ...	2	..	2
	3	12	15
Diseases of the Reproductory System—			
(1) Ectopic Gestation ..	1	...	1
	54	60	114

Table V.—Preparation of Media.

Media.	Quantity.
Vitamin Agar	20,100 cc.
Loefflers Medium	1,200 cc.
Broth for Waters	220,000 cc.
Ascitic Agar	1,080 cc.
Blood Agar	1,080 cc.
Russels Medium	400 cc.
1% Sodium Taurocholate ..	240 cc.
Phosphate Broth	720 cc.
20% Lactose	2,100 cc.
1% Dextrose Agar	2,400 cc.
1% Sugars	7,200 cc.
Nutrient Broth	4,800 cc.
Endo Agar	4,800 cc.

The number of Throat Swabs for diagnosis has continued to increase. Loeffler's Medium was used throughout the year.

Agglutination tests for the enteric group increased by about 80%.

There has been a general increase of 2,464 specimens during the past year. This represents an increase of more than 50% in the past 2 years. It will be very difficult to continue unless additional space, staff and equipment are provided at a very early date.

K. Leigh Evans,
Bacteriologist and Pathologist.

RETURNS.

TABLES.

I.—Staff.

Medical Staff.

(Those marked * are registered under Section 17 of Law 49 of 1908 or Laws 1872-1896.)

Office.	Name and Qualifications.
Superintending Medical Officer ..	Hallinan, Major T. J., C.B.E., M.B., B.S. Lond. M.R.C.S., Eng., L.R.C.P., Lond., D.P.H., Dublin Univ.
Senior Sanitary Medical Officer ..	Hall, J. M., M.R.C.S., Eng., L.R.C.P., Lond. C.P.H. Johns Hopkins.
Medical Superintendent, Public Hospital, Kingston	Westmorland, A. S., M.R.C.S., Eng., L.R.C.P. Lond., D.T.M. & H. Eng.
Resident Medical Officer, Public Hospital, Kingston	Baxter, G. F., M.R.C.S. Eng., L.R.C.P. Lond.
Do. do. do. do.	Clark, L.M., M.R.C.S. Eng., L.R.C.P. Lond.
Do. do. do. do.	Stockhausen, J. M., M.D., C.M. McGill, L.M.S., Nova Scotia.
Do. do. do. do.	Morrison, H. L., M.B., Ch.B. Edin.
Do. do. do. do.	Ferguson, L. St. C., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg.
Do. do. do. do.	Golding, M. S., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg.
Supernumerary Medical Officer ..	Shirley, I. O. B., L.M.S.S.A. Lond.
Do. do. do. ..	Binns, C. G., M.B., Ch.B. Edin.
Do. do. do.	Embden, H. M., B.Sc., M.D. Howard, L.M.S. New York.*
Do. do. do.	Rob, V. R., L.R.C.P. & S. Edin, L.R.F.P.S. Glasg.
Dental Surgeon Public Hospital, Kingston, (part-time)	DePass, S. C., D.D.S.
Radiologist, Public Hospital, Kingston (part-time)	Parkin, C. F. H., M.D., C.M., D.P.H. McGill.*
Government Bacteriologist and Pathologist	Evans, K. R. L., L.R.C.P. & S. Edin., L.R.F.P.S., Glasg., M.P.H. Harvard.
Medical Superintendent, Lunatic Asylum ..	Hewson, R. W. D., L.R.C.P. & S. Edin., L.R.F.P.S., Glasg., M.R.C.S. Manitoba.
Assistant Medical Officer, Lunatic Asylum ..	Myers, J. S., M.D., C.M. McGill.*
Do. do. do. do.	Cameron, J. J., M.R.C.S. Eng., L.R.C.P. Lond. M.D., C.M. Toronto, L.M. Rotunda Hosp., Dublin.
Do. do. do. do.	Murray, U. N., M.C.P. & S. Ont.
Do. do. do. do.	James, H. H., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg.
Visiting Surgeon, Jubilee Maternity Hospital, Kingston	Mellad, E. V. W., L.R.C.P. & S. Edin., L.F.P.S. Glasg.
District Medical Officers (under new terms of appointment).	
Whole-time	Davidson, R. H., M.D. Howard, U.S.A.*
Do.	Sherlock, R. G., L.R.C.P. & S. Edin., L.F.P.S. Glasg.
Do.	Anderson, A. A., M.R.C.S Eng., L.R.C.P. Lond.
Do.	Gordon, S. R. M., M.D. Howard, L.M.S., Columbia U.S.A.*
Do.	Curphey, A. G., L.R.C.P. & S. Edin., L.F.P.S. Glasg., M.C.P. & S. Ont.
Do.	Levy, L.R., M.B., Ch.B. Edin.
Do.	Myers, A. E. C., M.B., Ch.B. Aberd.
Part-time:	Vaz. C. E., L.R.C.P. & S. Ed., L.R.F.P.S. Glasg.
Do.	Ritchie, F. A., L.R.C.P. & S. Edin., L.F.P.S. Glasg.
Do.	Lecesne, G. I., M.B., Ch.B. Ed.
Do.	Escoffery, W. I., M.B., Ch.B. Aberd., Cert. Lond. Sch. of Trop. Medicine.
Do.	James, K. G. W., M.R.C.S. Eng., L.R.C.P. Lond.
Do.	Strudwick, H. T., M.D., C.M. McGill.*
Do.	Arthurs, S. J., M.D. Howard, U.S.A.*
Do.	Greaves, E. S., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg.
Do.	McDonald, H. E. T., M.B., Ch.B. Aberd.
Do.	McFarlane, A. L., M.R.C.S. Eng., L.R.C.P. Lond.
Do.	Johnston, C. D., M.D., C.M. McGill.*

Office.	Name and Qualifications.
District Medical Officers (under new terms of appointment), *contd.*	
Part-time	Riddell, C. E., M.B., Ch.B. Aberd.
Do.	Mott-Trille, R., M.D. Alabama.*
Do.	Johnson, L. E., M.B., Ch. B. L'pool.
Do.	Douglas, E. G., L.R.C.P. & S. Edin., L.R.F.P.S., Glasg.
Do.	Wright, F. C. A., M.R.C.S., Eng., L.R.C.P. Lond.
Do.	Forde, J. H., M.D. Toronto.*
Do.	Hayden, A. R. C., M.D., C.M. Dal., L.M.S. Nova Scotia.
Do.	Chamberlain, R. L., L.R.C.P. & S. Edin., L.R.F.P. S. Glasg.
Do.	Grant, S. C., L.R.C.P. & S. Edin., L.R.F.P.S., Glasg.
District Medical Officer (under old terms of appointment)—	
Part-time	Evans, F. R., M.D. New York, U.S.A.*
Do.	Cooper, R. F. C., M.D., C.M. Dal., L.M.S. Nova Scotia
Do.	Tate, D. L., M.B. Ch.B. Glasg., F.R.C.S. Edin.
Do.	Sanford, Noel, M.D. Canada.*
Do.	Isaacs, S. A., M.D. Bellevue Medical College.*
Do. do.	Lofthouse, W. O. R., L.R.C.P. & S. Edin., L.R.F.P. S. Glasg.
Do.	McKenley, A. G., L.R.C.P. & S. Edin., L.F.P.S. Glasg.
Do.	Lyon, L. B., M.C.P. & S. Ont. M.B. Toronto.
Do.	Clarke, A. T., M.D., C.M. Montreal.*
Do.	Lloyd, I. S., L.M.S.S.A. Lond.
Do.	Lopez, M. M., L.M.S.S.A., Lond.
Do.	Jackson, P. C., M.D. Howard.
	(three positions were vacant at the end of the year with Supernumerary Medical Officers acting).
Port Health Officer and District Medical Officer, Port Royal	McIntosh, J. N., M.B., Ch.B. Edin.
Port Health Officer, Port Antonio	D.M.O. Port Antonio.
Health Officers (Central Government)—	
Whole-time:	Cruchley, I. J., M.R.C.S. Eng., L.R.C.P. Lond., C.P.H. Johns Hopkins.
Do.	Murray, E. E., M.B., B.S. London.
Do.	Cruchley, F. H. N., M.R.C.S. Eng., L.R.C.P. Lond., M.B., B.S. Lond., C.P.H. Johns Hopkins.
Do.	Lawrence, H. S., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., D.P.H. Lpool.
Do.	Branday, W. J., M.R.C.S. Eng., L.R.C.P. Lond., C.P.H. Johns Hopkins.
Do.	MacPhail, D. H., M.B., Ch.B. Glasg.
Do.	Escoffery, G. S., M.B., Ch.B. Aberd., C.P.H., Johns Hopkins.
Do.	Watson, L. M., M.B., Ch.B. Aberd., C.P.H. Johns Hopkins.
Do.	Lowe, F. E., L.R.C.P. & S., Edin., L. F. P. S. Glasg. (acting).
Do.	Castle, H. D. B., L. S. A. London (acting).
Part-time.	Norton, F. A., M.R.C.S. Eng., L.R.C.P. Lond.
Do.	Pengelley, C. E., M.D., C.M. McGill, D.P.H. Trinity, Dublin*.
Medical Officer, Malaria Commission ..	Aris, F. W., M.R.C.S. Eng., L.R.C.P. Lond.
Medical Officers, Hookworm Commission ..	Chambers, H. D., M.D., Ch.B. Aberd.
Do. do. do. ..	Sinclair, T. B., L.M.S. Nova Scotia.
Medical Officers, Yaws Commission ..	Johnston, H. M., M.B., Ch.B. Edin. (on study leave).
Do. do. do. ..	Arnold, L. E., L.M.S. Nova Scotia.
Do.	Peat, A. A., M.B., Ch.B. Aberd.
Medical Officers, Tuberculosis Survey and Clinic.	
Whole-time.	Isaacs Saward, Dr. E. Joyce, M.R.C.S. Eng., L.R.C P. Lond.
Part-time.	Cory, R.A. S., M.B., Ch.B., Bristol, M.R.C.S. Eng. L.R.C.P. Lond.
Surgeon, St. Catherine District Prison (part-time)	Blair, H. H., M.D., Long Island College Hospital, Brooklyn, N.Y.*

Principal Members of Nursing Staff.

Matron, Public Hospital, Kingston	Douglas, Miss A. J., M.B.E.
Assistant do. do.	Walton, Miss A.
Matron, Jubilee Maternity Hospital ..	Lewis, Miss M. S.
Assistant do. do.	McNeil Smith, Miss E.
Matron, Lunatic Asylum	Tyler, Miss H. J.
Assistant do	Grant, Miss M.
Matron, Lepers' Home	McPherson, Miss M.
Matrons in Public General Hospitals: ..	Spencer, Miss S. A.
	Sterling, Miss D. V.
	Armstrong, Miss M.
	Orgill, Miss M. I.
	Manahan, Miss E. D.
	Edwards, Miss Ethel
	Webster, Miss V. M.
	Bird, Miss H. L.
	Nicolson, Miss Julia
	Robotham, Miss M. L.
	Marshall, Miss A.
	Thomas, Miss S. A.
	Leamey, Miss E. F.
	Pennicott, Miss H. M.
	Drummond, Miss E. M.
	Bennett, Miss A. H.
	Wright, Miss L.
	Levy, Miss A. L.
	McIntosh, Miss M. L.

Principal Members of Subordinate Medical and Sanitary Staff.

Dispenser, Public Hospital, Kingston ..	Thomas, M. J.
Dispenser, Lunatic Asylum	Robinson, C. C. A.
Superintendent and Dispenser, Lepers' Home ..	Levy, E. A. A.
Dispensers in Public General Hospital ..	Hossack, C. W.
	Anderson, I. W.
	Bryan, A. V.
	Bryce, Egbert
	Young, D. S.
	Edwards, T. B.
	Andrean, J. A.
	Johnson, S. A.
	Bernard, H. G.
	Watson, V. F.
	Patrickson, C. H.
	Stewart, E. A.
	Bolton, D. O. L.
	Brown, W. S.
	Palmer, J. A.
	Wade, R. M.
	Robb, C. A.
Supernumerary Dispensers —	Rodgers, G. B.
	Gruber, C. I.
	Miller, O. G.
Overseers of Works, Hookworm Commission ..	Duncanson, B. B.
	Davis, H. W.
Senior Technician, Malaria Commission ..	Edwards, Miss Gwyn.

II.—FINANCE.

(A) Return shewing the Expenditure of the Medical Department for the year ended 31st December, 1933.

——	Personal Emoluments.	Other Charges.	Total Expenditure.	Amount of Dues collected.	Actual Expenditure after deducting Dues collected.	Grants Estimated.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
General Administration—						
Island Medical Office ..	4,138 5 11	396 18 8	4,535 4 7	..	4,535 4 7	4,796 0 0
District Medical Officers ..	15,813 1 8	86 7 11	15,899 9 7	..	15,899 9 7	15,872 0 0
Duty Allce. D.M. O., Stony Hill	5 0 0	..	5 0 0	..	5 0 0	5 0 0
Health Officer, Port Royal ..	532 3 4	..	532 3 4	..	532 3 4	600 0 0
House Allowances D.M.Os. ..	759 14 9	..	759 14 9	..	759 14 9	860 0 0
Supernumerary Medical Officers	795 3 3	..	795 3 3	..	795 3 3	800 0 0
Hookworm Commission ..	5,717 7 11	1,482 1 10	7,199 9 9	..	7,199 9 9	6,922 0 0
Malaria Commission ..	1,813 13 4	1,974 11 9	3,788 5 1	..	3,788 5 1	4,019 0 0
District Nurses and Caretakers ..	532 7 2	204 4 10	736 12 0	..	736 12 0	912 0 0
Supernumerary Dispensers ..	503 1 3	..	503 1 3	..	503 1 3	509 0 0
Fees for Medical Board ..	4 13 4	..	4 13 4	..	4 13 4	10 0 0
Fees for Medical Council ..	23 2 0	..	23 2 0	..	23 2 0	20 0 0
Bacteriological Branch ..	1,440 14 11	322 5 4	1,763 0 3	180 8 9	1,582 11 6	1,746 0 0
Quarantine ..	547 11 3	383 3 0	930 14 3	114 6 1	816 8 2	962 0 0
Central Board of Health ..	8,711 4 4	1,900 10 8	10,611 15 0	..	10,611 15 0	11,101 0 0
Trav. Allce. D.M.Os., etc. ..	..	2,100 4 4	2,100 4 4	..	2,100 4 4	1,975 0 0
Bureau, P. H. Education ..	..	115 4 9	115 4 9	..	115 4 9	200 0 0
Training School for S. I. ..	..	41 10 3	41 10 3	..	41 10 3	50 0 0
School Dental Clinics ..	..	480 8 9	480 8 9	31 0 0	449 8 9	700 0 0
Treatment of Yaws ..	..	2,012 10 4	2,012 10 4	..	2,012 10 4	2,000 0 0
Vaccination Fees ..	..	1,317 18 10	1,317 18 10	..	1,317 18 10	975 0 0
Drugs and Poisons Law ..	..	38 9 0	38 9 0	121 10 0	83 1 0	25 0 0
Midwifery Law ..	..	12 7 10	12 7 10	..	12 7 10	10 0 0
Drugs	..	3,162 18 4	3,162 18 4	..	3,162 18 4	2,900 0 0
Expenses under Part IV, P.H. Laws	..	328 12 8	328 12 8	..	328 12 8	763 0 0
Railway Fares for candidates for Appointments.	..	..	..	..	..	2 0 0
V. D. Clinic ..	..	431 1 9	431 1 9	..	431 1 9	285 0 0
Medical Hospitals and Lepers' Home—						
Public Hospital, Kingston ..	15,672 10 0	18,022 8 1	33,694 18 1	1,371 3 5	32,323 14 8	36,616 0 0
Jubilee Hospital, Kingston ..	1,399 18 5	1,788 19 1	3,188 17 6	1,081 7 0	2,107 10 6	3,134 0 0
Lepers' Home ..	854 3 0	1,866 14 10	2,720 17 10	..	2,720 17 10	2,817 0 0
Seventeen Dispensers ..	3,331 13 4	..	3,331 13 4	..	3,331 13 4	3,340 0 0
Nineteen Matrons ..	2,214 16 7	..	2,214 16 7	..	2,214 16 7	2,233 0 0
Morant Bay Hospital ..	352 1 8	833 0 9	1,185 2 5	10 19 4	1,174 3 1	989 0 0
Hordley Hospital ..	464 14 4	863 7 2	1,328 1 6	4 3 2	1,323 18 4	1,510 0 0
Port Antonio Hospital ..	619 15 6	1,228 16 9	1,848 12 3	150 5 6	1,698 6 9	1,893 0 0
Buff Bay Hospital ..	587 14 2	922 1 11	1,509 16 1	46 8 3	1,463 7 10	1,817 0 0
Annotto Bay ..	566 5 10	1,461 8 8	2,027 14 6	73 7 6	1,954 7 0	1,968 0 0
Port Maria Hospital ..	648 19 8	1,715 5 4	2,364 5 0	66 9 0	2,297 16 0	2,541 0 0
St. Ann's Bay Hospital ..	514 2 0	1,217 17 9	1,731 19 9	232 10 0	1,499 9 9	1,386 0 0
Cave Valley Hospital ..	221 2 3	315 9 11	536 12 2	5 4 0	531 8 2	540 0 0
Falmouth Hospital ..	346 19 3	519 14 1	866 13 4	1 18 6	864 14 10	1,105 0 0
Ulster Spring Hospital ..	180 2 3	348 7 7	528 9 10	13 19 6	514 10 4	581 0 0
Montego Bay Hospital ..	1,027 0 2	2,408 12 7	3,435 12 9	267 5 7	3,168 7 2	3,389 0 0
Lucea Hospital ..	367 7 11	1,218 11 11	1,585 19 10	35 1 10	1,550 18 0	1,382 0 0
Sav.-la-Mar Hospital ..	748 16 3	1,646 10 11	2,395 7 2	256 19 6	2,138 7 8	2,638 0 0
Black River Hospital ..	602 18 6	1,830 12 1	2,433 10 7	134 9 1	2,299 1 6	2,336 0 0
Mandeville Hospital ..	557 18 1	1,069 7 9	1,627 5 10	129 16 6	1,497 9 4	1,931 0 0
Chapelton Hospital ..	487 17 5	826 16 2	1,314 13 7	0 7 4	1,314 6 3	1,327 0 0
Lionel Town Hospital ..	510 11 7	1,075 7 2	1,585 18 9	13 19 6	1,571 19 3	1,701 0 0
Spanish Town Hospital ..	602 12 9	1,702 6 8	2,304 19 5	9 19 9	2,294 19 8	2,213 0 0
Linstead Hospital ..	557 14 10	1,089 0 2	1,646 15 0	12 6 6	1,634 8 6	1,690 0 0
Instruments ..	..	494 17 1	494 17 1	..	494 17 1	600 0 0
Inland Freight ..	..	649 11 1	649 11 1	..	649 11 1	670 0 0
Transport of Lepers ..	..	71 3 10	71 3 10	..	71 3 10	70 0 0
Farm—Lepers' Home ..	..	4 0 0	4 0 0	..	4 0 0	10 0 0
Maintenance of Children of Lepers	..	172 17 8	172 17 8	..	172 17 8	200 0 0
Cleaning Compounds ..	..	33 15 0	33 15 0	..	33 15 0	50 0 0
Cleaning Latrines ..	..	170 10 3	170 10 3	..	170 10 3	190 0 0
Repairs to Furniture ..	..	88 13 9	88 13 9	..	88 13 9	120 0 0
Miscellaneous ..	..	206 10 8	206 10 8	..	206 10 8	190 0 0
	74,775 0 2	62,654 7 6	137,429 7 8	4,365 5 7	133,064 2 1	142,236 0 0
Lunatic Asylum ..	21,731 7 3	18,991 3 10	40,722 11 1	3,198 6 5	37,524 4 8	48,127 0 0

(B) Return showing cost per occupied Bed for the year ended 31.12.33.

	Average No. of Beds occupied.	Cost of Staff.	Other Charges.	Total.	Cost per occupied Bed per annum.	
					Staff.	Other Charges.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Public Hospital, Kingston ..	386	15,672 10 0	18,022 8 1	33,694 18 1	40 12 7	46 13 10
Jubilee ..	29	1,399 18 5	1,788 19 1	3,188 17 6	48 5 6	61 13 9
Lepers' Home ..	118	854 3 0	1,866 14 10	2,720 17 10	7 4 9	15 16 3
Morant Bay ..	28	672 1 8	833 0 9	1,505 2 5	24 0 1	29 15 0
Hordley ..	34	784 14 4	863 7 2	1,648 1 6	23 1 7	25 7 10
Port Antonio ..	55	919 15 6	1,228 16 9	2,148 12 3	16 14 6	22 6 11
Buff Bay ..	40	901 14 2	922 1 11	1,823 16 1	22 10 10	23 1 1
Annotto Bay ..	50	886 5 10	1,461 8 8	2,347 14 6	17 14 6	29 4 7
Port Maria ..	69	968 19 8	1,715 5 4	2,684 5 0	14 0 10	24 17 2
St. Ann's Bay ..	35	834 2 0	1,217 17 9	2,051 19 9	23 16 8	34 15 11
Cave Valley ..	11	341 2 3	315 9 11	656 12 2	31 0 2	28 13 8
Falmouth ..	28	566 19 3	519 14 1	1,086 13 4	20 4 11	18 11 2
Ulster Spring ..	9	300 2 3	348 7 7	648 9 10	33 6 11	38 14 2
Montego Bay ..	65	1,327 0 2	2,408 12 7	3,735 12 9	20 8 4	37 1 1
Lucea ..	29	661 7 11	1,218 11 11	1,879 19 10	22 16 2	42 0 5
Sav.-la-Mar ..	67	1,068 16 3	1,646 10 11	2,715 7 2	15 19 1	24 11 6
Black River ..	77	904 18 6	1,830 12 1	2,735 10 7	11 13 3	21 19 1
Mandeville ..	34	877 18 1	1,069 7 9	1,947 5 10	25 16 5	31 12 7
Chapelton ..	39	807 17 5	826 16 2	1,634 13 7	20 14 2	21 4 0
Lionel Town ..	45	844 11 7	1,075 7 2	1,919 18 9	18 15 6	23 17 11
Spanish Town ..	68	922 12 9	1,702 6 8	2,624 19 5	13 11 4	25 0 8
Linstead ..	42	877 14 10	1,089 0 2	1,966 15 0	20 17 11	25 18 7
	1,358	33,395 5 10	43,970 17 4	77,366 3 2		
Lunatic Asylum ..	1,864	21,731 7 3	18,991 3 10	40,722 11 1	11 13 2	10 3 9

III.—Return showing the value of Drugs, etc., supplied to the various Institutions from the Island Medical Stores from 1.1.33 to 31.12.33.

	£ s. d.
Value of Drugs and Sundries issued to Public General Hospital, Lepers' Home and Medical Districts ..	7,186 1 6
" Stimulants issued to Public General Hospitals ..	58 0 5
" Drugs, etc., issued to Kingston Public Hospital ..	5,320 13 3
" Stimulants issued to Kingston Public Hospital ..	106 1 9
" Drugs, etc., issued to Jubilee Hospital ..	154 19 1
" Stimulants issued to Jubilee Hospital ..	0 17 0
" Drugs, etc., issued to Lunatic Asylum	311 5 1
" Drugs, etc., issued to Prisons and Reformatories ..	344 4 7
" Drugs, etc., issued to Department of Agriculture	5 8 0
" Drugs, etc., issued to Quarantine Board ..	4 5 6
" Drugs, etc., issued to Parochial Boards ..	969 10 5
" Stimulants issued to Kingston & St. Andrew Corporation	1 6 6
" Drugs, etc., issued to Constabulary Department ..	58 13 1
" Drugs and Sundries sold	389 13 4
" Lymph issued to District Medical Officers ..	537 0 0
" Lymph sold	11 8 0
" Drugs, etc., issued to Hookworm Commission ..	420 19 9
" Quinine issued to Post Office for packets ..	965 15 10
" Drugs issued for fumigation	53 14 2
" Quinine issued to Schools	70 7 6
" Quinine issued to Estates	12 10 0
" Drugs issued to Jamaica Government Railway ..	29 9 7
" Drugs issued to Tuberculosis Clinics	461 11 1
" Drugs issued to Malaria Commission ..	14 16 2
" Drugs issued for the control of Epidemic Diseases	76 15 11
" Drugs issued to Cayman Islands	0 14 9
" Drugs, etc., issued to Yaws Commission ..	473 7 10
	£18,039 9 1

IV.—Return of eases in the Kingston and St. Andrew Corporation Hospital for Infectious Diseases.

Admission.	1925	1926	1927	1928	1929	1930	1931	1932	1933
Alastrim	312	172	2	..	..	..	..	..	..
Chicken Pox	31	49	116	23	3	17	31	69	19
Measles	9	40	1	..	..	4	31	45	13
Syphilis	10	12	5	3	5	7	11	..	4
Diphtheria	1	..	..	..	..	..	..	..	..
Pneumonia	..	..	..	..	..	..	..	..	..
Yaws	..	5	1	1	2	7	3	..	1
Whooping Cough	..	..	..	..	..	..	..	1	..
Ring Worm	..	..	..	..	..	..	..	..	..
Scabies	..	..	4	3	..	..	..	..	..
Insect Bites	..	..	..	..	..	..	..	..	..
Enteric Fever	..	..	..	..	..	..	..	..	..
Arsenical dermatitis	..	..	..	..	..	..	..	..	..
Pulmonary Tuberculosis	1	..	..	..	..	..	..	..	..
Eczema	..	1	..	..	..	..	..	..	..
Mumps	..	..	..	..	9	5	..	..	..
Searlet Fever	..	..	..	..	4	7	10	..	..
Leprosy	..	..	..	..	1	..	1	2	1
Impetigo	..	..	..	..	..	..	..	..	1
Under observation	15	15	1	3	..	..	..	3	..

The hospital was closed on four separate occasions: 12th to 17th March, 20th to 24 th June, 17th to 31st October, 22nd November to end of the year. In November instructions were reeeived that no ease of mild communicable disease (as Chicken Pox or Measles) was to be admitted.

I. J. Cruchley,
Medical Offieer of Health., Kingston.

APPENDICES.

Co-Operative Public Health Work in Jamaica during 1933.

The fifteenth year, 1933, of eo-operation between the Government of Jamaiea and the International Health Division of the Roekefeller Foundation was highly sueeessful in spite of serious handieaps caused by unprecedented rainfall and three storms of hurrieane intensity. All of the Units of Publie Health Work were eontinued and during the year Government assumed the entire finaneial responsibility of the Hookworm Commission, the Malaria Commission, the Sehool for Sanitary Inspeetors, and the Paroehial Health Departments; and made plans for taking over during 1934 the Sehool Dental Clinies and the elinieal work of the Tubereulosis Commission and for the provision of an up-to-date diagnostie laboratory. In addition, more effeetive means of controlling Yaws and Tubereulosis were initiated.

The co-operative work began in May 1919 with the organization of the Hookworm Commission, the first definite publie health work to be organized in the Colony, whieh sinee its beginning, has been eondueted from an edueational standpoint. The methods found by the Hookworm Commission to be effeetive in carrying health problems to the people have been applied in all subsequent units of eo-operative work.

At the present time, when Government is assuming the eontrol of the units of health activity it is interesting to note some of the results of the work of the past 15 years. The people appreeiate the value of health work as is shown:

(1) In the increased amounts provided by the Central Government and the Paroehial Boards for sueh work. In 1919-20 the total spent was £37,450; eaeh year there has been a gradual inerease as health aetivities were developed, the total spent in 1931-32 being £107,145.

(2) Larger and better trained staffs are employed for health aetivities. In 1919 only Kingston employed a whole-time Medieal Offieer of Health and the one Sanitary Inspeetor in the Island who held qualifieations from the Royal Sanitary Institute. Now, 10 of the 14 parishes have whole-time Medical Offieers of Health, while trained sanitary inspeetors are employed in all 14 parishes. Of 110 inspeetors trained at the Sehool for Sanitary Inspeetors, 66 also hold eertifieates from the Royal Sanitary Institute of London. In addition 55 sanitary inspeetors are employed in speeial work, such as the Hookworm, Malaria, Tubereulosis and Yaws Commissions.

(3) There has been a marked deerease in the Colony's death-rate. In 1921, the population of the Island was 858,118, with 24,383 deaths, the death-rate being 28.5 per thousand. In 1932, the population was estimated at 1,073,493 with 18,265 deaths, the death-rate being 17.2 per thousand.

(4) The Loeal and Central Boards of Health are carrying on other aetivities than the eo-operative publie health units. Among these may be mentioned the improvement and extension of sanitation and the supervision of water supplies, the treatment of malaria and yaws and syphilis, vaeination against smallpox and typhoid fever, the improvement of sehools and the treatment of defective pupils, the enaetment of

building regulations designed to prevent overcrowding in poorly built and ill-ventilated houses, and in an awakened interest on the part of the people for better homes and cleaner villages. These developments mark an advance from generalized to specific efforts to meet the definite problems which are responsible for ill-health and show that the people have become public health minded.

From the beginning the co-operative work has been conducted under the supervision of the Superintending Medical Officer and the Central Board of Health. Major T. J. Hallinan came to Jamaica in May, succeeding Dr. B. M. Wilson, as Superintending Medical Officer. Dr. J. A. Henderson, Senior Sanitary Medical Officer, left for British Guiana in June to become Surgeon General of that Colony; he was succeeded by Dr. J. M. Hall, at that time Assistant Director of the Bureau of Health Education. The Director for the Rockefeller Foundation in Jamaica during 1933 was Dr. B. E. Washburn.

Through the cooperative health work definite problems have been undertaken as a means of demonstrating the value of disease prevention to the Government and to the people. Teaching by demonstration has been effective in Jamaica; here as elsewhere a few definite and concrete examples of disease control have been more effective than a larger number of partly performed undertakings could ever have been. This report gives a brief account of the development of each unit and will serve as an introduction to more detailed accounts of the activities of 1933 which are given in the Annual Reports of the different Units. More space is given to the work of the Tuberculosis and Yaws Commissions than to other units since these will continue on a co-operative basis during 1934.

I.—The Jamaica Hookworm Commission.

During 1933 as in the past the control of hookworm and other bowel filth diseases was conducted through four units; two were engaged in sanitation and two in treatment work. Sanitation campaigns in Hanover and Westmoreland reached 2,977 homes with a population of 13,690. Treatment campaigns were continued in Trelawny and St. James; a total of 38,698 people being examined out of a population of 38,745. Of these, 28,719 or 74% were found to be infected with hookworms; treatment was given to 25,183 of those infected and 23,823 or 83% were cured.

Since co-operative public health work begun in 1919 with the Hookworm Commission led to other activities, a brief description will be given of the general methods employed in the hookworm campaigns. In Jamaica the responsibility for sanitation is in the hands of the 14 local boards of health (the Parochial Boards); but in the preparation of districts for hookworm treatment campaigns sanitation is carried out through a co-operative arrangement between the Central Board of Health and a Local Board. The Central Board provides an "overseer of works" who is placed in charge of from 4 to 8 sanitary inspectors of the local board; this staff brings about latrine building in thickly settled areas of from 5,000 to 10,000 population selcted for treatment campaigns. Each campaign is in the nature of a demonstration in public health work, no treatment being given except in sanitated areas. Usually four demonstration areas are selected in each parish and the sanitation and treatment campaigns each lasts about 18 months.

During the sanitation of an area the people are visited in their homes and taught the necessity of having sanitary latrines, the inspector showing where and how these should be built. The cost of material and construction are borne by the houseowner, except in the case of paupers where the cost is shared equally by the Central and Local Authorities. If an owner refuses to sanitate or if the construction is unduly delayed the bye-law requiring a sanitary latrine at each home is enforced.

The type of latrine required has been improved from year to year. At present the pit type is recommended for general use and, where substantially built according to correct designs, has given satisfaction in all parts of the Island. The pit should be at least eight feet deep, with sloping sides to prevent caving in, covered with a fly-tight seat box made of sound lumber. In loamy or sandy soils the pit must have its sides lined with flat stones placed on each other. In all cases, the top of the pit must be surrounded by a cement wall to prevent the access of surface water. Near the sea or where ground water is near the surface, the latrine box and building are placed on cement bases high enough above the ground to prevent splashing.

It is interesting to compare sanitation existing at present in parishes which have not had sanitation campaigns with conditions found in 1919 when the Commission was organized. At the earlier date less than 4% of homes had latrines of any type, none being sanitary; during the present year, 36% of the homes visited for the first time were found equipped with latrines and 4% of these were sanitary latrines of an approved type.

The activities of the Hookworm Commission are fundamentally educational and in each treatment campaign an effort is made to reach every person living in the area. The family is taken as a unit and disease prevention is presented as a matter of personal interest. The story of hookworm disease and the results of treatment are explained by means of charts and an album of Jamaica photographs. The microscope is used and hookworm ova andl arvae are shown to impress upon the people the necessaity of latrine maintenance. Handbills and leaflets are also used. General lectures, illustrated with magic lantern slides and moving pictures, are given in each area by the medical director.

The staff of each treatment unit consists of a medical officer and 14 assistants. The area is divided into districts of from 300 to 500 people and a trained inspector known as a "nurse" is placed in each. Every house is visited, a census is taken of the inmates, and a specimen tin left for each person. The nurses collect the tins at a subsequent visit and bring them to the central office and laboratory which has been set up in the area. The Willis salt flotation method of examination is employed. Those found infected are visited in their districts by the medical director and each is prescribed for individually. Treatment is then carried out by the nurse, the patients being treated in groups at a convenient place or in their homes. Medicine is never left with the patient but always swallowed in the presence of the nurse. A first treatment of oil of chenopodium (24 minims for an adult) and, a week later, a second treatment of thymol (40 grains for an adult) are given each patient, compound jalap powder being used as the purgative. A week following the treatment with thymol, a second specimen is obtained and examined to find out if a cure has been effected. Those not cured are given additional treatments until they are shown, by microscopical examination, to be free of the infection.

The control of hookworm disease does much more than give relief from this one malady. A demonstration campaign affords an object lesson in public health by showing a community or a parish what con certed effort organized under trained direction can accomplish. Aside from the direct results of controlling hookworm disease the campaigns of the Hookworm Commission have aided in creating a favourable sentiment for sanitary control and for the establishment of a permanent island-wide system of public health.

Public health work in Jamaica has developed from the hookworm campaigns. Following these it became the rule for each Local Board to extend the areas of soil pollution control to include the entire parish. This undertaking required trained sanitary inspectors and these were found to need supervision and guidance to secure sanitation of a permanent nature. A whole-time medical officer of health for each parish was found desirable when other units of work were organized.

The value of hookworm campaigns as a means of educating the people in public health is well exemplified in Jamaica; it has been the means of introducing modern public health work into the Colony. School hygiene, the training of sanitary inspectors, malaria control, the study and control of tuberculosis, yaws control, public health education—all of these have come into being as a result of the work of the Hookworm Commission. And the Commission has been a training school for health workers. Seven of the nine medical offieers of health already given permanent appointments had service in the Hookworm Commission; and more than 20 of the most successful sanitary inspectors had their first service with the Commission.

During 1933 Dr. T. B. Sinclair was Medical Officer in Charge of Unit No. 1 and Drs. L. E. Arnold, A. A. Peat, and H. G. Chambers in turn directed Unit No. 2. The Overseers of Works are B. B. Duncanson and H. W. Davis. The total Government budget allotment for the sanitation and treatment units amounted to £6,948; in addition 7 sanitary inspectors were provided by co-operating Parochial Boards, the average salary of each being above £10 per month.

II.—School Dental Clinics.

School Dental Clinics were conducted in the parishes of Kingston, St. Andrew, St. Catherine, Clarendon, Hanover, St. James, Trelawny, St. Mary, and Portland during 1933. Dental defects are by far the most common handicap to school children in Jamaica, more than 70 per cent. of the pupils of some schools being in need of treatment, and dental treatment is the school hygiene work that receives the best co-operation from teachers, parents and pupils.

During 1933 schools were visited in 9 parishes and 19,678 pupils were given 41,703 treatments.

The School Dental Clinics are conducted from an educational standpoint. The dentist, provided with a portable outfit, visits the schools in turn and conducts clinics at the schoolhouse. The mouth of each child is inspected and whenever necessary the teeth are cleaned even if no defects are present. The child is taught to keep the teeth clean and go to a dentist without delay in case of beginning decay. Decayed teeth are either filled or extracted and each pupil's mouth is put in good shape. There are also lectures and demonstrations in oral hygiene and school health to which parents and others are invited. Teaching oral hygiene is the object of the dental clinic. And the demonstration that modern dentistry is not as painful as achingteeth has made the pupils eager to obtain treatment; more than this, parents have become interested and increased numbers of adults are losing their fear and visiting dentists for the first time in their lives

The first school dental clinic was organized in St. Andrew in 1926 through a co-operative arrangement between the Kingston and St. Andrew Corporation and the Hookworm Commission. The practicability of such work was soon demonstrated and in 1927 clinics were started in the Kingston schools. In 1928 the work was extended to St. Mary in April, and to Trelawny in October. Clarendon, St. James and Hanover provided for school dental clinics in 1930, Portland in 1932, and St. Catherine in 1933.

The school dental clinics are conducted through the Parochial Health Departments, under the direction of the Medical Officers of Health, as part of school hygiene work. The health officers examine defective pupils selected by the teachers and arrange for the correction of physical defects, such as decayed teeth, diseased tonsils and adenoids, and for the treatment of pupils infected with hookworms. And in areas where malaria is endemic special attention is given to schools. Health education has become an important part of the curriculum of the elementary schools and teachers are making more use than ever of the Bureau of Health Education, and especially of *Jamaica Public Health*.

The school dental clinics will form an important part in the school medical service which is planned for the future.

The table which follows gives the details of the work of the school clinics during 1933:

Table showing Details of Work of School Dental Clinics during 1933.

Parish.	Total hours of Work.	Number of pupils treated.	Number of Treatments.				Total Treatments.
			Prophylactic.	Fillings.	Extractions.	Other	
Hanover	502	3,846	545	675	3,012	46	4,278
St. James ..	507	2,077	736	1,986	1,941	409	5,072
Portland	510	2,620	1,624	1,793	972	486	4,875
Trelawny ..	526	1,352	2,129	1,548	1,524	345	5,546
St. Mary ..	..	2,766	2,512	3,206	1,659	..	7,377
Kingston ..	456	1,860	2,551	785	2,148	270	5,754
St. Andrew ..	402	2,073	2,381	1,592	1,413	202	5,588
Clarendon* ..	..	1,566	878	340	856	46	2,120
St. Catherine* ..	156	1,518	74	338	652	29	1,093
Totals ..	..	19,678	13,430	12,263	14,177	1,833	41,703

* The Statistics for Clarendon are for the months of September, October and November, only; those for St. Catherine are for the months of September, October, November and December.

III.—THE BUREAU OF HEALTH EDUCATION.

The Bureau of Health Education was established in 1926 to meet the demands from teachers, sanitary inspectors, and citizens for information regarding personal hygiene and the spread and prevention of disease. In addition to educational activities the Bureau acts as an adviser to the units of co-operative health work. It is also a clearing house for the reports of these units and through it the International Health Division extends its assistance to the Government of Jamaica. The Director of the Bureau is the Director for Jamaica of the Rockefeller Foundation; and he was also Director of the Hookworm Commission, the Malaria Commission, the School Hygiene Work, and the Parochial Health Departments unti lSeptember, 1933 when Government assumed direction of these units.

The main educational work of the Bureau consists in publishing *Jamaica Public Health*; volume 8 of which was issued during 1933, an edition of 20,000 copies being sent out each month. Particular attention was paid in this volume to Tuberculosis and Yaws and special numbers were devoted to Safe Water Supplies, Milk, and to programmes for Empire Health Week. The bulletin is used in more than 250 schools of the island as a text in hygiene and would be adopted in other schools if more copies of the publication could be supplied. The mailing list includes health and social welfare workers in the following countries: Argentine, Australia, Barbados, Brazil, British East Africa, British Guiana, British Honduras, British West Africa, Canada, Canal Zone, Cayman Brac, China, Colombia, Costa Rica, Cuba, Cyprus, England, Honduras, Hungary, India, Italy, Java, Leeward Islands, Malta, Mauritius, Mexico, Montserrat, Nicaragua, Nigeria, Panama, Paraguay, Philippine Islands, Poland, Puerto Rico, St. Helena, St. Lucia, St. Vincent, Seychelles, Sierra Leone, South Africa, Switzerland, Trinidad, Turks Islands, United States of America, Venezuela, and Zanzibar. And it may be of interest to add that requests have been received for permission to republish articles or health stories or plays in English, Spanish, Greek, and Chinese.

Education in public health is of most value when there is an early opportunity of putting precepts into practice; the work of the Bureau of Health Education has been largely restricted to teaching the facts about public health problems which are receiving practical consideration in the Colony. It is most important to educate the adult; the head of the family must be shown the necessity of disease prevention—he must consent before the school child can be vaccinated, given dental treatment, or have his adenoids and diseased tonsils removed. And it is the adult who pays the taxes which support control campaigns and permanent health departments. In Jamaica, at least, education of the adult has proved to be of greater importance than the education of the child.

Suitable literature is provided on the problems which are being dealt with by the health departments of the Island. Assistance is given health workers through the provision of moving picture projectors and films, magic lanterns and slides, and material for microscopical demonstrations. Also special leaflets and posters and placards, designed for use in schools, at markets, and other public places, to give information about the more common diseases, are distributed. During 1933 the Bureau of Health Education sent out 39 different publications; the total number of pieces of public health literature distributed being above 400,000.

A branch of the Bureau of Health Education is the Division of Pre-Natal Work. A set of 9 letters (one for each month of pregnancy) is sent out to expectant mothers to teach them the normal changes which occur during pregnancy and the dangers which should be looked for and avoided; the names of such mothers being supplied by health officers, sanitary inspectors, nurses, and social welfare organizations. During the year 9,702 letters were mailed to 1,078 expectant mothers.

The clerical staff consists of Mrs. L. V. Barham, Secretary, and Miss E. Forbes, Clerk, who are paid by the Rockefeller Foundation from a budget of £550, which also provides for office expenses. Government provides offices, printing, and free mail franking privileges. These amounted to at least £2,500 during 1933; and in addition there was a vote of £200 for supplies and educational material.

IV.—The School for Sanitary Inspectors.

The School for Sanitary Inspectors was organized in 1927 and from its beginning has been affiliated with the Royal Sanitary Institute of London; by adopting the curriculum prescribed by the Institute Jamaica was made an examination centre and students who complete the course of study at the local school are eligible to take the examinations of the Institute.

In organizing the School, the Rockefeller Foundation assisted with an appropriation of £100 to buy scientific equipment; and a teaching museum has been collected. A Vote of £150 from Government bought furniture and teaching equipment; and there is an annual grant of £50 per year to meet current expenses, fees to lecturers, transportation of students on visits to public health departments included in their training.

The Fifth Session of the School opened November 15, 1932, and continued until March 3, 1933. Of 27 students 14 were from the staffs of the Central and Local Boards of Health; the additional 13, were selected from nearly 300 candidates and a majority of them holding Cambridge University certificates or the equivalent. The session was directed by Dr. J. M. Hall, Assistant Director of the Bureau of Health Education and at the time Acting Senior Sanitary Medical Officer. The teaching staff were from the following Government and Parochial Departments: the Bureau of Health Education, the Government Laboratory, the Hookworm Commission, the Malaria Commission, the Tuberculosis Commission, and the Yaws Commission; the Public Works Department; the Meteorological Department; the Department of Agriculture; the Kingston and St. Andrew Corporation Health and Water Departments; the Kingston Courts; and Jamaica College.

The Course of Study consisted of the following: Elementary Physics and Chemistry in relation to Water, Soil, Air and Ventilation; Meteorology; Elementary Bacteriology; Elementary Mathematics; Air and Ventilation; Nuisances and Offensive Trades; Meat Inspection; Control of Slaughter Houses, Sewage Farms, Tanneries, Soap Factories, Garbage Disposal, etc., Disinfection, Disinfestation, Rat Killing; Communicable Disease Control; Food Sanitation, Milk Control, Canned Goods Inspection; Rural Hygiene, Hookworm, Malaria, and Tuberculosis Control; Entomology; Water Supplies, Methods of Protection and Purification; Refuse Disposal; How to make Reports; the Art of Lecturing; Duties of a Sanitary Inspector; Sanitary

Laws, Bye-Laws, and Court Procedure; Office Methods and Records. In addition to lectures there were provided laboratory work, visits of inspection, and practical work in connection with the operation of slaughter houses, sewage farms, tanneries, soap factories, filter plants, dairies, garbage disposal plants, Tuberculosis Dispensary, the Child Welfare Clinics, the Hookworm Commission, and the Poor House, bakeries, ice factories, and restaurants.

Of the 27 students who attended the Fifth Session of the School, all but 1 were successful with their examinations and received certificates. The examination of the Royal Sanitary Institute was taken by 19 pupils, all but one were successful and received certificates.

In the progress made in public health work in Jamaica the School for Sanitary Inspectors has played an important part. This is particularly true as regards the education of the people in disease prevention; the sanitary inspector is the one member of the health department who goes into the homes of the people and has the greatest opportunity for teaching them the underlying principles of keeping well. The School has always stressed the point that a sanitary inspector is a teacher rather than a policeman and education of the people has had an important place in the work which has resulted in reducing the death and sickness rates in Jamaica during the past decade.

At the time the School was organized there was only one Inspector in the Island who held a certificate from the Royal Sanitary Institute and the great majority of sanitary inspectors employed by the Local Boards of Health were part-time employees and looked after sanitation in addition to other jobs such as road overseers, market clerks, and inspectors of poor. The pay of these men was low, sometimes only 10/- per week. The average salary of sanitary inspectors has increased 300 to 400 per cent., showing that better trained men are now going into health work; also, that these men have impressed the Local Boards of Health with their usefulness. During the five sessions of the School 110 inspectors were given training and 66 of these hold certificates from the Royal Sanitary Institute. The Central Board of Health will not, as a rule, approve of the appointment by Local Boards of Health of inspectors who are not in possession of certificates from either the School for Sanitary Inspectors or the Royal Sanitary Institute.

V.—The Jamaica Malaria Commission.

The Malaria Commission was organized in 1929 to carry out control measures indicated by the Survey conducted in 1928-29 which showed that malaria rarely exists in an endemic form at elevations of more than 500 feet, except in irrigated areas. The south side of the island showed foci of high incidence in the parishes of St. Thomas, St. Catherine, Clarendon, and St. Elizabeth and on the north side in St. James and St. Mary; also, a wide zone of lower incidence exists in the parishes of Westmoreland and Hanover and similar smaller areas on the north coast, mainly in Portland parish.

The Survey located four main groups of areas in which malaria is prevalent; these in the order of their importance as regards high endemicity, size of population, and economic importance, are as follows:

(1) Annotto Bay, Oracabessa, Montego Bay, Sav.-la-Mar, Black River, Vere, Caymanas and Golden Grove. (2) Port Morant, Buff Bay, Hope Bay, St. Margaret's Bay and Port Maria. (3) Windsor Castle (Portland) John's Hall, Gayle, Bull Bay, Epsom, Enfield, Orange Bay, and Little London. (4) Broadgate, Devon, Ocho Rios, Drapers (Portland), Cave Valley, Green Island, Ferris, Bog Walk, and the Hampden-Dumfries area.

Breeding places of mosquitoes were located and carefully mapped during the survey. Four species of anophelines were found, namely: *A. albimanus*, *A. grabhami*, *A. crucians*, and *A. vestitipennis*. Observations point to *A. albimanus* as the most important if not the only malaria vector. This species has definite habits which simplify control measures.

Since its organization the Malaria Commission has directed its attention mainly to control in the areas of Group 1, in all of which the disease had been endemic for many years. It is expected that when control measures have been conducted for a sufficiently long time there will be a decrease in the incidence of the disease in the areas in which there is only a seasonal prevalence. To the areas of Group 1 have been added Little London, and Falmouth where the disease appeared in epidemic proportions during 1931.

The activities of the Malaria Commission are conducted through (1) a Central Office and Laboratory in Kingston and (2) Ten Field areas. The central office is the headquarters of the medical officer, who is assisted by two technicians. The work of this office, aside from the routine clerical and accounting work and the keeping of records and reports, consists of the microscopical examination of blood smears and the identification of larvae and adult mosquitoes sent in from the field. Dissection of mosquitoes is carried out; also, blood smears sent in by health officers and practitioners are examined.

Each field area is in charge of a trained sanitary inspector who is assisted by from 2 to 5 labourers. The area in which control is carried out extends, as a rule, for $1\frac{1}{2}$ miles about the centre of population and is divided into sub-areas, in each of which is located one or more "catching stations" where at regular intervals a white horse is used as a bait and all the mosquitoes alighting on the animal during $1\frac{1}{2}$ hours, at sunset, are caught and sent to the Laboratory for identification. The catching stations are located so as to form concentric circles throughout the area and this easily gives a clue to the locality of breeding when there is an increase in the number of mosquitoes taken at any week's catchings. Before beginning control measures in an area a careful survey is made and the location of breeding places of anopheles mosquitoes mapped; dippings for larvae are made at regular intervals in all these places. Larvae are classed under 4 groups, according to size, and the results of dippings determine when Paris green need be applied. Also before control meaure are instituted in an area the medical officer visits the schools and examines the pupils for enlarged spleens and takes smears for blood examinations. And each year, or oftener if necessary, the spleen and blood examinations are repeated and the results compared with those of previous examinations and of the Survey; the blood and spleen indices thus obtained show the success of control measures. And for purposes of comparison similar examinations are made at schools outside the control areas.

The labourers under the supervision of the inspector are employed to apply Paris green dust and to keep the banks of fresh water streams cleared of vegetation that will prevent small fish from gaining access to the larvae. During the dry seasons the labourers are kept busy gathering dust, mixing it with Paris green, and storing it for future use. They also keep drains clear of debris which may cause standing water

after showers. And each year an effort is made to carry out definite projects of permanent control. These include ditching, drainage, the sledging of holes in limestone rock which hold rainwater, the filling of small ponds, and the opening of channels to admit seawater into permanent collections so as to keep these brackish.

The inspector is constantly on the lookout for cases of fever occurring in his area. Each week he visits the hospital and other institutions and takes blood from all suspicious case of fever occurring in these as well as among the citizens of the area. These smears are sent to the Laboratory for examination.

The work of the Malaria Commission has been effective in reducing the incidence of fever in the endemic areas. The results are evident: in all the control areas there has been a marked decrease in the number of cases of malaria, in spleen and blood rates, and fewer cases of the disease are now being treated at hospitals and dispensaries, while the attendance at schools has greatly increased.

Control in the field area is largely through the treatment of standing water with Paris green dust, i.e., 1 part of Paris green mixed with 99 parts of road dust or powdered limestone or 1 part of Paris green with128 parts of sand and crushed limestone. In two areas, in particular, destroying holes in limestone rocks so that they will not hold collections of rainwater has been highly effective. Subsoil tile drainage and open ditches are also employed. In such work, as well as by providing extra labourers, the Commission has had the support of estates located in the areas.

Control of malaria in other than the larger endemic areas is carried out by the Local Boards of Health (Parochial Boards). The Malaria Commission acts in an advisory capacity to these and in this way has assisted in the organization of control measures in a number of the areas classified in Groups 2, 3 and 4.

During 1933 the Malaria Commission continued its work along the lines found to be effective during the past. The rainfall for 1933 was abnormally heavy, the mean rainfall for the Island being 116 inches, while the average mean rainfall for the previous 63 years is 76 inches. So much rain increased the work of the Commission since the areas under control are for the most part in districts having rainfall much above the average for the Island as a whole. But in spite of the heavy rains which resulted in many temporary breeding places with an increase in the number of anopheles mosquitoes, there was no very marked increase in the disease in any of the 10 areas where control measures were conducted; and these places were formerly the worst sites of endemic malaria. There was, however, a great increase in the incidence of malaria in places outside the control areas.

The success in controlling malaria in areas which were once badly handicapped by sickness from this cause makes the work of the Malaria Commission an outstanding piece of public health work in which results have been accmplished by applying information gained through a Survey made before control measures were started.

Dr. F. W. Aris is medical officer of the Malaria Commission and Miss G. Edwards and Miss D. Blackwood the technicians. During 1933 the Commission operated on a budget of £4,000 from Government and £200 from the Rockefeller Foundation.

VI.—Parochial Health Departments.

The history of medicine is very similar in the colonies of the British Empire. In Jamaica medical service was provided at first by doctors subsidized by large estates, but with the abolition of slavery and the decline of the planter aristocracy the number of physicians in the Colony decreased and many districts were left without adequate medical attention. In 1868 a Government Medical Service was organized and the island divided into 44 districts, each in charge of a medical officer, and a number of hospitals were established. Advances in medicine and surgery soon brought about an increase in the number of hospitals and, later, the discovery of the causes of infectious diseases led to the control of epidemics. In more recent years attention has become focused on prevention, which has made it necessary to change the form of administration of medical departments to keep pace with the demands of the people for health education and improvement of conditions which lead to ill-health and poverty.

Organized public health work began in 1919 with the Hookworm Campaigns, a demonstration in public health which created a desire among the people for further information about disease prevention and health conservation. Progressive teachers became aware of the relationship between physical defects and mental retardation, and School Hygiene Work with dental clinics was begun in 1924. A more definite effort was then made to reach the people in their homes and teach them the principles of health conservation through the establishment of a Bureau of Health Education. In 1927 the School for Sanitary Inspectors was organized to train the officers of the health department who go into the homes of the people and have the greatest opportunity for teaching them how to keep well. The training was designed to make the sanitary inspectors teachers rather than mere sanitary policemen. And the more important diseases have received attention. A Malaria Survey was conducted in 1928, since when control measures have been instituted in areas of large population where this disease is endemic. Also, in 1928, a Tuberculosis Commission was organized and the disease which is the greatest single cause of death in Jamaica is now being studied at dispensaries in Kingston and other towns where patients can come for examination and treatment. The latest undertaking was the formation of a Yaws Commission in 1932.

A natural outcome of this steady advance in the development of public health work in Jamaica was the organization of each parish as a unit through which disease control activities could be carried to the people. Kingston, St. Andrew, and Clarendon early provided full-time health officers. In other parishes the need of such officers became recognized as more and more sanitary inpsectors were employed and the people demanded that attention be given to sanitation, the protection of public water supplies, the inspection of food and food handlers, and the control of infections. A Medical Commission in 1928 made a study of the health needs of the Colony and recommended that each parish should have a full-time health officer, with special training, appointed and paid by the Central Government. The plan was approved by the Legislative Council in 1929 and became effective April 1, 1930; all but two (St. Ann and Westmoreland) of the 14 Parochial Boards have accepted the plan. At the end of 1933 nine (Kingston, St. Andrew, St. Catherine, Clarendon, Manchester, St. Mary, Trelawny, Portland and Hanover) of the twelve co-operating parishes were permanently organized under the new plan; the remaining three have health officers holding temporary appointments. These three parishes (St. Thomas, St. James, and St. Elizabeth) will be permanently organized when health officers who have had special training are available.

To assist in demonstrating the practicability of parochial health departments, directed by full-time health officers with adequate staffs and equipment, the Rockefeller Foundation co-operated with Government and the Parochial Boards in the organization of such departments in St. Mary, Trelawny and St. Catherine. The Health Officers chosen for these departments were given special training on Foundation Fellowships. The demonstration in each parish continued for three to four years, the work being conducted under the direction of the Central Board of Health. The object was to find the most effective methods of conducting health work in Jamaican parishes and adapt these to the control of the more important health problems of the Colony. Each staff consists of the full-time health officer, an office clerk, a chief sanitary inspector and from 4 to 10 assistants.

The routine programme of work carried out in the three demonstration parishes has been adopted throughout the Colony, since these three departments were able, through the provision of more adequate budgets, to try out and determine most effective methods; in this way they have served as examples to other parishes.

Among the activities in which the parochial health departments are engaged the control of communicable diseases takes first place, typhoid being one of the more important problems. Supervision of sanitation with the installation of latrines which will control the bowel filth diseases, the car of the sick in hospitals, and the vaccination of contacts are the steps taken to control typhoid. All cases of contagious diseases are visited by an officer of the department to insure that measures are being carried out to prevent their spread. Each parish has a small laboratory where examinations can be made for intestinal parasites, malaria, and tuberculosis. Treatments are given for hookworm disease and clinics are conducted for the control of tuberculosis. In addition to these activities, each department is concerned with general sanitation, food sanitation and the examination of food vendors, as well as the inspection of water supplies.

The Local Boards of Health have a wide range of legal powers and duties under the Public Health Law, but in the past the lack of trained whole-time personnel has prevented the enforcement, or at least the effective enforcement, of regulations which would accelerate progress in disease control. But definite progress was made in the three demonstration departments in training the public to realize their legal responsibilities with regard to the spread of preventable diseases. And similar methods are being found effective in all twelve parochial health departments.

Health education through work in the schools and general lectures and conferences is given attention and treatment is provided for pupils suffering from hookworm disease and dental defects, these being the more common handicaps to school children in Jamaica.

Correct records are kept of the work done in each parish and monthly reports are made to the Local and Central Boards of Health.

The *St. Mary Health Department*, the first to be organized, completed its four-year programme of co-operative work at the end of September, 1932. Dr. I. J. Cruchley was health officer from October, 1928, until January, 1932. He was succeeded by the present health officer, Dr. H. S. Lawrence, who holds a degree in public health from the Liverpool School of Tropical Medicine. In addition to its routine work, the St. Mary Department supervises the control measures of the Malaria Commission in the Oracabessa Area.

The Trelawny Health Department ended its fourth and last year of co-operative work in October, 1933. For three years Dr. J. M. Hall, now the Senior Sanitary Medical Officer, was the health officer, being succeeded by Dr. W. J. Branday, upon the latter's return from a year of study as a Foundation Fellow. The Trelawny Department has done outstanding work in the control of malaria and tuberculosis.

The *St. Catherine Health Department*, the last of the co-operative departments to be organized, completed its third and final year at the end of December 1933. The parish is the largest in area and population in the Island. Dr. G. S. Escoffery, the health officer, in addition to the routine work of his department, has developed child hygiene work with the assistance of a public health nurse.

The budget of each co-operative parochial health department amounted to £2,000, of which the Foundation contributed 25 per cent. during the first year, $16\frac{2}{3}$ per cent. the second year, and $8\frac{1}{3}$ per cent. the third and fourth years, the remainder being supplied by the parish. Government paid the salary and travel of the health officer and this plan of co-operation between the Local and Central Government continues as a permanent fixture in all the twelve parishes.

VII.—The Tuberculosis Commission.

Tuberculosis being the greatest single cause of death in Jamaica, the Government with the view of ascertaining the facts necessary for effective control in 1927 invited the Rockefeller Foundation to co-operate in a study of the disease as it affects the Colony. Professor Eugene L. Opie, of the University of Pennsylvania and now of Cornell University, was secured to direct the study. He visited Jamaica in 1928 and directed the establishment of a study clinic (dispensary) in Kingston, with Dr. E. J. Isaacs as Medical Officer in Charge, to obtain direct contact with patients suffering from the disease in order that observations could be made of the forms, nature and course of the infection in individuals, family groups, and contacts, and the influences of conditions of living upon its distribution. Since 1928, Dr. Opie has paid yearly visits to Jamaica and has kept in close touch with the work of the Tuberculosis Commission.

In November, 1930, Dr. C. W. Wells of the Foundation Staff began the operation of an X-ray laboratory in connection with the Kingston Dispensary, being assisted by Dr. C. H. Parkin, of the Public Hospital. This proved of great value in the diagnostic work and, also, served to increase the interest of medical practitioners in tuberculosis. In order to broaden the work of the Dispensary and gain a wider view of tuberculosis as it exists in a tropical country, the staff was joined in July, 1931, by Drs. H. H. Smith and E.W. Flahiff to assist in conducting enlarged and more intensive studies through a house to house canvass of certain sections of Kingston and of a number of smaller towns and rural sections of the Island.

2. *The Kingston Tuberculosis Dispensary.*—The Tuberculosis Dispensary since 1928 has conducted activities which may be grouped under five headings:

(a) The examination of patients, presenting themselves at the Dispensary, or referred by practitioners or the Public Hospital; for diagnostic purposes; also the examination of Contact Cases. The methods

employed have the people feel that they receive a thorough examination and that a real interest is taken in their welfare and subsequent progress by the staff. From small numbers in the first year of operation, the ever increasing attendance of patients necessitated early in 1930 an enlargement of the dispensary and staff, Dr. R. A. Cory being appointed Assistant Medical Officer. The following is the routine procedure employed. When a patient presents himself for examination a history is taken by a nurse; the patient is then seen by a physician who recommends sputum, tuberculin, and X-ray examinations if these are considered to be necessary. Each patient with tuberculosis has two sputum examinations made if tubercle bacilli are found, while in sputum negative cases ten specimens from each patient are examined if they can be obtained. The sputum examinations are made by the usual method, the results being recorded in terms of the Gaffky count, and, also, by the Hughes' method.

(b) Social Service Work by Visiting Nurses. When a diagnosis of pulmonary tuberculosis is made and the patient resides in an accessible area he and his family become the subject of special study. A nurse pays regular visits to the home and gathers detailed information about the social status and surroundings of the patient and of all persons who live with him. All contacts are advised to attend the dispensary for examination and an increasingly large proportion of such cases do so. The nurse when visiting the home instructs the patient how to carry out the directions of the doctor as to rest, diet, and personal hygiene. These visits of the nurses are made at frequent intervals, since adequate follow-up of contacts cannot be maintained unless each nurse keeps in close touch with her cases.

There are four nurses on the Dispensary staff; two are paid by the Foundation and two by the Anti-Tuberculosis League; their work has been of great benefit to the patients and it has been an important means of acquiring information necessary for complete studies of family groups.

(c) The Compilation of Records for Special Studies. A complete record is kept of each patient, showing the results of examinations and treatment and the general progress made by the individual in his fight for recovery. A graph which shows the tubercular history of each member of the household is made for every family entered for social service work. Special individual records and copies of family groups are prepared for statistical analysis by a vital statistician of the Foundation's staff.

(d) Office Work: Clerical and Technical. The histories of the Dispensary patients and the records of the visiting nurses are properly transcribed and neceassry indexing and filing systems are maintained by the clerical staff, consisting of a secretary and technician who combines these duties with the laboratory work.

(e) Surgical Treatment. In February, 1933, treatment by artificial pneumothorax was begun. Cases are carefully selected and, at first, those with high pyrexia were not included; but, in spite of the obvious disadvantages of treating very sick patients living at distances up to seven miles from the Dispensary, results have been so encouraging that pyrexia is now disregarded and cases which had daily temperatures of from 103 to 104 degrees are responding well to this form of treatment. The procedure of artificial pneumothorax has been attempted on 64 patients, one being an acute pneumonia which responded admirably to treatment which was maintained for 3 weeks. One patient died, one left Kingston and died four months later in the country, one developed an acute spread to the other lung, and one developed ascites. Ten had to be abandoned because of dense adhesions, while 48 are still under treatment and most of them are doing well. Of the 10 cases abandoned because of adhesions, 7 were treated by phrenic avulsion, 1 refused this operation, 1 has left Kingston, and one has died. In addition to the above 6 cases, 3 other cases had phrenic avulsion performed. It is desirable that facilities be arranged for an extension of surgical procedures in the treatment of the disease.

During 1933, a total of 1,329 new patients were examined at the Dispensary; of these 379 were suffering from pulmonary tuberculosis, 294 being sputum positive and 85 sputum negative. There were 42 persons with latent tuberculosis and 62 with calcified lesions; also 10 cases were found of tuberculosis of other organs, while 25 cases are suspected of having tuberculosis. An aggregate of 9,476 visits to the Dispensary were made by old patients; 1,835 persons were given tuberculin tests. The nurses made 7,150 visits to the homes of patients. In the laboratory 2,755 specimens of sputum were examined, 725 being positive and 2,030 negative.

The Kingston Dispensary has made available a large number of patients, from the observation of whom valuable information regarding the nature and spread of tuberculosis in the city has been obtained. More than this, the work of the Dispensary has aroused the interest of Government and the people in control of the disease throughout the Island and during the past five years Dispensaries have been started in Port Maria, Spanish Town, Linstead, Montego Bay, Falmouth, Ulster Spring, Port Antonio, Mandeville, May Pen, Lucea, and other towns in parishes having full-time medical officers of health. At all these places the same general routine is followed and much the same records are kept as at the Kingston Dispensary.

As an outgrowth of the need demonstrated by the Dispensary, the Kingston and St. Andrew Corporation erected in 1931 a hospital of 42 beds for the care of indigent tuberculous cases at the Union Poor House at Admiral Pen. This has been of great benefit in the control of the disease among the poor of the city; at present a large number of cases now seek admission to the poor house voluntarily, whereas before the opening of the hospital it was difficult to persuade the most destitute to enter the poor house. There is urgent need for enlargement of this hosptal and the provision of adequate medical supervision to make these tuberculosis wards increasingly useful both for the treatment of early cases as well as the segregation of those with advanced disease. The medical officers of the Dispensary do not have supervision of the care given patients in the tuberculosis wards, though the co-operation of the poor house authorities has been sympathetic. During the past year, re-examination of cases has been arranged and each week from 6 to 10 patients from the hospital are brought to the Dispensary for re-examination, incluing X-ray. It is to be hoped that during the coming year arrangements can be made whereby the medical care of the patients can be supervised by the officers of the Dispensary.

3. *The X-Ray Laboratory.*—The X-ray Laboratory as an adjunct of the Kingston Dispensary was opened January 20, 1931, to assist in the diagnosis of tuberculosis and to confirm the type of the disease. From the beginning these services have been extended to physicians for the examination of their private patients. During 1933, a total of 3,496 X-ray examinations were made; of these 1,676 were examined for the Dispensary, 393 being re-examinations of old cases and 621 were examinations of new cases reporting for

diagnosis, and 1,055 were made of family contacts. There were 602 examinations made of patients referred by practising physicians, the remaining 1,218 examinations being of persons from the areas covered by the Survey.

In addition to the above routine work, 197 chest examinations were made of cases selected by the Yaws Commission. And one day each week was givin for examining tubercular patients from the Corporation Hospital. The X-ray outfit was also used in the study of lungs obtained from autopsies at the Poor House and at the Mental Hospital. In addition, facilities of the developing room were extended, as in the past to the Mobile Unit of the Tuberculosis Commission, and 3,000 films were developed for the Unit during 1933,

4. *The Kingston Survey.*—In August, 1931, thefacilities of the X-ray Laboratory were extended to make a tuberculosis survey of selected areas of Kingston. This survey, under the direction of Dr. C. W. Wells, assisted by Dr. H. H. Smith, a sanitary inspector, a laboratory technician, two nurses, and two office assistants, by the close of 1932 had completed a study of the areas of Smith Village, Hannah Town, and Facey's Brick Yard, representative of the poorer sections of Kingston and with the greatest congestion of population. From December 1, 1932, to July 1933, the survey was carried on in Franklin Town where housing conditions are better and where the people live in less crowded conditions; from July to the end of 1933, the Brentford Road area was included in the survey, this area having still better housing and a less crowded population The information obtined from the survey of these areas can be compared and the effect of different conditions of housing and varying congestion of poulation on the incidence of tuberculosis determined.

The general procedure of the survey is to have the sanitary inspector make a call upon each household and take an accurate census of the inmates, at the same time making a sanitary survey of the premises. The two nurses carry out tuberculin tests on all members of the households as they are added to the census. Those indivduals who react to the tuberculin test are brought in the station wagon to the X-ray Laboratory, where stereoscopic films area taken of each. Those persons showing lesions in the X-ray pictures are brought in a second time for physical examination and clinical study, and any requiring treatment are referred to the Tuberculosis Dispensary.

The total population in the Franklin Town area, as revealed by the census, was 1,662 persons. Of these, 1,505 or 90.5% were given the tuberculin test and 1,217 reacted. Of the reactors, 1,122 received X-ray examinations; by this means 14 cases of clinical pulmonary tuberculosis were discovered, while 87 other cases showed evidence of latent tuberculosis. There were 414 households in the area, with an average of 4 persons per household. While the average size of the household is larger in this area than in Smith Village and Hannah Town (see 1932 report), the number of persons per room are fewer.

The Brentford Road area was selected as a part of the city where living and economic conditions are better than in the areas previously surveyed. On July 12, a successful meeting was held in St. Luke's Church Hall to which the people had been invited by letter. It was decided to have one of the nurses do a preliminary survey of the area in order to learn how successful a public health nurse can locate cases of tuberculosis in a community. This was completed in about ten weeks; the nurse took a history of each household in order to detect any suspicious cases of the disease. She visited 260 households with a total population of 1,233 individuals; 39 individuals from 35 households were suspected of being tuberculous. Of this number 15 persons have been X-rayed to date.

The regular survey in the Brentford Road area was begun on August 15. Up to the end of the year 203 households had been reached, with a total population of 971, of whom 552 have received the tuberculin test. Of those tested, 434 or 78.6% reacted to the tuberculin; and of these reactors, 323 have been X-rayed. This examination showed 2 with clinical tuberculosis, while 19 have been diagnosed as having latent lesions and 8 remain with diagnosis incomplete.

The survey in the Brentford Road area will be completed during the first three months of 1934.

5. *Pathological Studies.*—Through co-operation on the part of the management of the Corporation Poor House, autopsies were made on inmates dying of tuberculosis during the year, 61 lungs being obtained for study. Also, in connection with the tuberculosis studies at the Mental Hospital, 91 lungs were obtained from patients dying in that Institution. All of these lungs have been carefully X-rayed and dissected. Numerous photographs and lantern slides were made of specimens showing interesting aspects of tuberculosis. Bacteriological investigations have been carried out on material obtained from some of these autopsies, the object being to study the nature and virulence of the tubercle bacilli in Jamaica.

6. *Studies at the Mental Hospital.*—Through the interest and assistance of the Medical Superintendent of the Jamaica Mental Hospital, the tuberculosis studies started in 1928 were continued during 1933. Tuberculin tests, wherever possible, were made on all new admissions. Of the 550 patients admitted to the Institution during the year, 364 received the tuberculin test, and of these 333 reacted. Of the 31 negative cases, 15 were included in the group for vaccination, the remaining number being designated as Controls. The vaccination consisted of injections of heat killed tubercle bacilli into the skin of the forearm. The object of this procedure is to induce a high degree of immunity against tuberculous infection. During the year 23 patients received 115 vaccinations; in order to study the local reactions to these injections, frequent photographs of the local area were taken.

An important addition to the work done at the Mental Hospital has been an extension of the use of the X-ray; during the year, 335 chest X-ray examinations were made of 262 patients. In this group were included all cases suspected by the medical staff of being tuberculous, and all the individuals in the Vaccinated and Control Groups were so examined. During the last half of the year an attempt was made to X-ray all patients coming into the Institution as soon after admission as possible. As a result of the X-ray work, 13 cases of far advanced tuberculosis were discovered. And 13 additional cases of tuberculosis in early stages were found. Through this increased use of the X-ray and the careful autopsy of cases dying in the Institution, it is hoped that the exact epidemiology of the disease in such a hospital may be learned.

7. *The Mobile Unit.*—In addition to the work in Kingston, a Mobile Unit has studied the disease as it, exists in the smaller towns and in the rural sections of the Island. The Unit is in charge of Dr. E. W. Flahiff, assisted by a nurse and an office clerk. A portable X-ray machine is included in the equipment of the Unit.

The Mobile Unit started its work on September 1, 1931, in Trelawny parish; on March 4, 1932, headquarters were moved to St. James; on December 1, 1932, the Unit moved to Portland, where it worked until June 13, 1933, when it returned to St. James until the latter part of August; while from August 28 to the end of 1933 it operated in St. Catherine.

The activities of the Mobile Unit in each parish may be grouped under three headings:

(a) The examination and classification of all cases of tuberculosis known to the health department and the examination of all contacts of these cases.

(b) The establishment of a dispensary in the county seat where all persons presenting themselves with chest symptoms are given a physical examination and tuberculin test and X-rays taken of reactors to tuberculin. Persons free of symptoms are given the tuberculin test and those reacting are X-rayed.

(c) Tuberculin tests are carried out on pupils of a school in each county town and those reacting are given X-ray examinations. Also, special surveys are made of homes of children reacting to tuberculin.

(d) The house to house survey of special districts carried out in the way in which the survey of areas in Kingston is conducted. One district is slected in the county town and at least one strictly rural community is included in this survey.

Mobile Unit of Tuberculosis Commission.

During 1933, as already stated, the Mobile Unit worked in the parishes of Portland, St. James and St. Catherine. A Dispensary was held at the office of the Health Department in Port Antonio during the time the Unit was in the parish; a survey was made of the small towns and adjoining rural districts of Manchioneal and Hope Bay, and of a representative district of Port Antonio; and tuberculin tests were carried out in schools in or near the survey districts. At the Dispensary held in Port Antonio, 55 old patients were re-examined and 1,089 new patients examined; 1,160 tuberculin tests were made, of which 980 were positive; and 52 sputum examinations were made of which 26 were positive. Of the total number of new patients, 22 cases of sputum positive tuberculosis were discovered and 18 of sputum negative, while 7 cases had latent lesions, and in 31 the diagnosis was not completed. A summary of the surveys in the 3 districts shows the following: 593 households reached, having a population of 2,484; tuberculin tests were given to 1,989 persons, of whom 1,218 were positive, while 913 of the latter were X-rayed. The X-ray examinations showed 5 cases of sputum positive and 16 of sputum negative tuberculosis and 53 cases of latent tuberculosis. Of 1,177 school children given the tuberculin test, 580 reacted.

The Mobile Unit returned to St. James for six weeks to conclude work in the Dispensary in Montego Bay and to survey rural districts about Adelphi and Dumfries. At the dispensary 106 new cases and 45 old patients were given examinations; 31 tuberculin tests were made, of which 24 were positive; 30 sputum examinations were done, with 9 positive. As a result of this work, there were discovered 5 cases of sputum positive and 15 cases of sputum negative tuberculosis, 8 latent cases and 8 with diagnosis incomplete. In the house to house survey in the Adelphi-Dumfries area 233 households were reached, the total population being 985; 800 were given the tuberculin test and 436 of these were positive, of whom 395 were X-rayed. As a result there were found 1 case of sputum negative and 29 cases of latent tuberculosis, while in 8 cases the diagnosis was not completed.

From August 28 to the end of 1933, the Mobile Unit had headquarters in Spanish Town. At the Dispensary 13 old and 601 new cases were examined; tuberculin tests given to 611 patients, of whom 522 reacted, and 28 sputum examinations were made with 14 positive. The results were the location of 6 cases of sputum positive and 17 cases of sputum negative tuberculosis, 14 cases with latent lesions, while in 19 others the diagnosis had not been completed.

A house to house survey is in progress in a selected area of Spanish Town; the population is about 1,000 of whom 60% have already had tuberculin tests and about 65% of the reactors have had X-ray examinations. At the Government School in Spanish Town 611 pupils have been given tuberculin tests, and 359 are reactors. Of these children, 194 are in the infant school (ages 4 to 8); in this group there were 90 reactors. Of these 90, 42 lived in the country or could not be located in their homes. The homes of the other 48 were visited. and all the residents in the yards are being given the tuberculin tests, with X-ray examination of reactors. The object of this is to determine whether or not more active cases of tuberculosis can be located by examining particularly the adults in the homes or yards of young children who react to tuberculin. A special report will be made upon the completion of this study. Due to the apparent frequency of tuberculosis in Chinese residents special effort is being made to examine by the X-ray all Chinese food handlers in Spanish Town and nearby towns.

Aside from being an important means of securing data regarding the occurrence and course of tuberculosis in smaller towns and rural section of Jamaica, the Mobile Unit has been of great importance in assisting local health departments organize their work for controlling tuberculosis. Through the Dispensary, the work in the schools, and the house to house visits of the doctor and nurse, valuable educational work has been done and unfounded fears and local prejudices have been replaced by correct conceptions of the disease and the problems it creates in the community. A number of local boards of health, because of this educational factor, have invited the Mobile Unit to visit their parishes.

8. Since its organization in 1928, the aims of the Jamaica Tuberculosis Commission have been (a) to collect information concerning the character of the disease and the incidence of its various manifestations under varying conditions throughout the Colony; (b) to determine how the disease is spread and what conditions modify its transmission; (c) while making such studies to assist in the institution of procedures that, with present knowledge, give promise of combating the disease; and (d) by making use of newly acquired information to devise new preventive measures adapted to local conditions.

At the Kingston Dispensary the spread of tuberculosis has been followed in more than 1,500 families observed more or less continuously during the last five years. In connection with this, data has been gathered in regard to the incidence of tuberculosis at different ages in relation to the number of persons of corresponding age who attend the clinic, a comparison of the character of the disease in native black Jamaicans with that in other races that make up the Island's population, relation of the disease to occupation, and an analysis of the occurrence of the disease in relation to the social customs that affect family life; a study of the facts concerning all these may give suggestions of value for control.

The survey of four areas in Kingston give abundant information concerning the incidence and distribution of the various manifestations of tuberculosis in the city. The number of cases of the disease found in the field survey of certain areas has been four times the number of those with tuberculosis attending the Dispensary from the same areas.

The work of the Mobile Unit has made it possible to compare conditions in the rural districts with those in centres of population such as Kingston, Spanish Town, Montego Bay, and Port Antonio.

The Mental Hospital, through its co-operation, has made it possible to study several significant problems related to the spread of tuberculosis; but the most important purpose of the work undertaken there is to determine if protective inoculation will diminish the incidence of the disease. It is important to know if persons admitted to this Institution who have escaped tuberculosis infection and hence fail to react to tuberculin are, when later exposed to the disease, more likely to become ill with it than those who reacted before they were exposed. By "vaccination" with killed tubercle bacilli, it has proved possible to sensitize persons with no reaction on admission so that they react promptly to tuberculin. To determine what influence this "vaccination" has on resistance to the disease, persons who fail to react to tuberculin on admission are divided into two groups of which one receives "vaccine" and the other none. Reaction of the skin to the "vaccine" itself, administered five times at intervals of one week, gives evidence of sensitization.

Important measures for the control of tuberculosis have been inaugurated in Jamaica since the Rockefeller Foundation began its study of the disease in 1928. Dispensaries for the discovery of the disease have been established in Kingston and the larger towns of the Island, and hospital beds have been provided in 8 of the 14 parishes for the care and segregation of patients with tuberculosis. In describing results which have been attained towards the control of the disease mention must be made of the work of the Anti-Tuberculosis League which was organized in 1928. The League has been highly successful in raising funds through the sale of Christmas Seals, donations from interested citizens, and special entertainments given for its benefit. It has co-operated to the fullest extent with the Kingston Dispensary, paying the salaries and travel of two visiting nurses, as well as part of the expense of a nurse in Spanish Town. In addition it provides a fund to buy food for indigent patients and has paid the cost of keeping a number (12 during 1933) of children from children from tuberculous families at the Rio Cobre Home.

Parochial Tuberculosis Infirmaries.

During the five and a half years since its formation the Tuberculosis Commission assisted by the Anti-Tuberculosis League, has been the means of extending educational work regarding the disease to the more intelligent citizens of the Colony. A number of important developments have arisen from this: (1) there is better reporting of the disease than in the past; (2) in 1928 there was not a single Dispensary in the Island where people with suspicious symptoms could be examined to find out if they had tuberculosis. At present such Dispensaries are in operation in Kingston, St. Catherine, Clarendon, Manchester, Hanover, St. James, Trelawny, St. Mary and Portland parishes. (3) In 1928 there was not a single hospital bed in the Island for the care of tubercular cases and no parochial board gave special care to indigent patients. Tuberculosis wards for indigent patients are now maintained at the poor houses of Kingston and St. Andrew (42 beds), Portland (12 beds), St. Mary (16 beds), St. Ann (12) beds), St. James (16 beds), Hanover (6 beds), Manchester (8 beds). Plans are being made to build such wards by the Boards of St. Elizabeth and St. Catherine.

9. The information obtained as a result of the study of tuberculosis in Jamaica would indicate that the following observations are likely true for the Colony; (a) In Jamaica the disease spreads primarily from Kingston and the larger towns; (b) In the native Jamaican the disease ususally pursues a rapidly fatal course; (c) The number of tubercle bacilli eliminated with the sputum of patients is far greater than in those suffering from the more chronic forms of pulmonary tuberculosis prevalent in northern countries but the period of elimination is much shorter. (d) The spread of tuberculosis in Jamaica is promoted by the crowding of yard rooms and tenement yards in Kingston and the larger towns and by the insanitary habits of the poorer people. (e) Country people who come to the towns acquire pulmonary tuberculosis and, when they are no longer able to support themselves, return to their families in the country and transmit the disease to them. (f) The acute tuberculosis prevalent in Jamaica is transmitted to others after a brief period of exposure often not exceeding a few months, and consequently several members of a family may die in rapid succession. (g) Obvious transmission of tuberculosis from one adult to another (e.g., from husband or wife to the consort) is much more frequent than in the north.

10. Based on the information obtained as a result of the study of tuberculosis in Jamaica by the Tuberculosis Commission, taking into consideration the procedures by which control measures are being instituted, a report was prepared by Dr. Opie containing recommendations for the organization of tuberculosis control measures in Jamaica and submitted to Government on Augut 15, 1933. This report recommends:

1. Organization of all tuberculosis work under one Director who shall have direction under the Superintending Medical Officer of (a) all tuberculosis hospital work, including parish infirmaries; (b) tuberculosis dispensaries; and (c) of tuberculosis registration.
2. A Central Tuberculosis Clinic and training school organized as part or unit of the Kingston General Hospital under the Tuberculosis Director and consisting of (a) Wards for tuberculosis, (b) control tuberculosis dispensary of Kingston, and (c) of X-ray equipment.
3. Training of physicians (District Medical Officers, etc.) engaged in tuberculosis work in dispensaries, hospital wards, and parish tuberculosis infirmaries; tuberculosis nurses and sanitary inspectors in the Central Tuberculosis Clinic of Kingston.
4. Maintenance of tuberculosis wards in hospitals outside of Kingston under medical control of the Tuberculosis Director.
5. Maintenance of dispensaries and parish infirmaries by the parishes and under the medical control of the Tuberculosis Director.

The report was approved by Government and at the Autumn Session of the Legislative Council it was presented for the consideration of the Honourable Members. Consideration will be given to it at the regular session of the Council which convenes in February 1934.

11. The Tuberculosis work conducted in 1933 was financed by the Rockefeller Foundation, except that drugs, printing and stationery were supplied by Government; and the Jamaica Anti-Tuberculosis League provided two nurses for the Kingston Dispensary and a fund for the purchase of food for indigent patients. After the first of April, 1934, the beginning of the Government's financial year, arrangements have been made for the Island Medical Department to take over the maintenance and supervision of the Tuberculosis Dispensary and X-ray Laboratory in Kingston.

MEMORANDUM

By Dr. E. L. Opie

ON THE CONTROL OF TUBERCULOSIS IN JAMAICA.

A survey conducted during the last five years to determine the frequency and character of tuberculosis in Jamaica has shown the prevalence of the disease, especially in Kingston and smaller centers of population. It is evident that tubrculosis is one of the foremost public health problems of the Island since the death rate is high and the greater number of those who are disabled by the disease are at the threshold of adult life. Tuberculosis spreads when some adult member of a household, who has acquired the disease, transmits it to children and to other adults of the family. The disease in Jamaica usually pursues a rapidly fatal course and several members of the same family may acquire it and die within a year and a half after its introduction into the family. The first step in control of the disease is the discovery of the households that constitute these spots of epidemic spread.

The spread of tuberculosis in families is promoted by the overcrowding and insanitary housing conditions of the slum districts of Kingston, Spanish Town, Montego Bay and the smaller towns of Jamaica. Here tuberculosis spreads in crowded yards from one family to another. In rural districts, conditions are less favourable for the transmission and the disease is less frequent in country districts than in the cities.

Young persons who come in search of employment from the country to the city often acquire the disease. When, as the result of their disability, they are no longer able to support themselves they return to their people in the country and not infrequently transmit tuberculosis to the members of their own family but the opportunities for spread to other families are not so favourable as in the city.

Though it is evident that the figures representing the death rate from tuberculosis in Jamaica are only approximately correct, they show that nearly 1,500 persons die each year from this disease. We may assume that the number of persons with transmissible tuberculosis at any time is at least twice this number and probably considerably more. It is noteworthy that the relation of cases of tuberculosis to deaths from the disease far exceeds this ratio in Europe and the northern part of North America since tuberculosis in Jamaica pursues a rapidly fatal course.

The first step in any attempt to control the disease must be the discovery of those who are suffering with it. When persons with tuberculosis are found, they must be placed under conditions that will simultaneously prevent them from passing the disease to others and will give them the best opportunity for recovery. There are many difficulties in accomplishing these aims.

Unless the magnitude of the task is kept in mind, there is scant promise that the disease can be controlled. The establishment and maintenance of a costly sanatorium that will take care of two or three hundred patients can have little effect upon the spread of the disease, since a far greater number remain in their homes passing the disease to those about them. In many instances the cost of maintaining a sanatorium with its X-ray laboratory and trained personnel for a relatively small number of patients has pre-emptied all available resources for further anti-tuberculosis work.

A plan for control must aim to segregate and treat persons with tuberculosis as rapidly as they can be found, but discovery of cases and provision of adequate accommodation for them necessarily proceeds slowly. Control measures must be planned with such economy that essential growth will not outstrip available resources. A primary factor in the development of any plan of control is the training of personnel, including both doctors and nurses in the highly specialized procedures that will make them able to recognize and treat the disease in dispensariy clinics, in hospitals and in infirmaries, and will enforce those measures that are necessary to prevent spread of the disease.

Patients with tuberculosis fall into two groups: (a) Those with acute tuberculosis which appears suddenly and proceeds with severe illness, often causing death within a few months after onset. These patients require treatment in a hospital organised for the care of acute disease. Under proper care some of these patients will improve and pass into the second group. (b) Patients with chronic tuberculosis which continues over a period of years during which they are a source of contagion and since they are often able to be about, may spread the disease widely. These persons are frequently unable to work and must be supported. In the usual sense they are not paupers, since they would support themselves were they not disabled by their disease.

Means are available in Jamaica for the care of both kinds of patients. Hospitals throughout the island can be used to care for the first group. The essential requirements are wards for their admission and physicians and nurses with special training in the treatment of tuberculosis. Hospitals for the care of tuberculosis are established within every large city of Europe and of the northern part of North America and these hospitals are often part of general city hospitals.

Infirmaries for the care of tuberculosis have been provided by a considerable part of the parishes of Jamaica and others have the establishment of similar infirmaries under consideration. These infirmaries are suitable for the segregation of patients with chronic tuberculosis, but to be effective for care of the disease must afford adequate medical treatment and nursing. It may ultimately be desirable to establish a sanatorium in the higlands of Jamaica, but this should be done only when more pressing requirements are met. What are urgently needed at present are dispensaries for the discovery of the disease and hospital beds for its care, widely distributed and available in the centres of population where the disease is prevalent. There is a group of intelligent persons who, with adequate instruction and special facilities can be safely cared for in their own homes.

Progress toward the control of tuberculosis in Jamaica is evidently dependent in considerable part upon co-operation between the public health service of the Island represented by the Medical Officers of Health and the medical activities represented by the District Medical Officers, hospitals, infirmaries, etc. The establishment of clinics for the recognition of tuberculosis and their operation will be promoted by close co-operation between Medical Officers of Health and District Medical Officers in Kingston and the parishes. The use of hospital wards or poor house infirmaries for the care and segregation of patients with tuberculosis can be made effective only if medical care of tuberculous patients is under the direction of those who have

adequate knowledge of the disease. Infirmaries for the segregation and care of patients suffering from tuberculosis such as those established at the Poor Houses of Kingston and Montego Bay must have adequate medical supervision with special relation to the care of tuberculosis in order that they may function as institutions where tuberculosis can be effectively segregated and effectively treated.

The following are recommendations concerning the control of the disease:

1. All tuberculosis activities in Jamaica should be under the direction of an officer with adequate knowledge of the disease. These activities include:
   a. Clinics for the recognition and home care of tuberculosis.
   b. Hospitals and infirmaries for the segregation and treatment of tuberculosis.
   c. Registration of tuberculosis.
2. The central tuberculosis clinic operating in Kingston in intimate association with hospital facilities should provide training in tuberculosis for those medical officers who will be concerned with the disease, for nurses, and perhaps for some sanitary inspectors, who may aid in bringing patients with tuberculosis to parish dispensaries.
3. The proposal made by Major Hallinan to establish tuberculosis wards in hospitals in different parts of the Island would very greatly increase the facilities for segregation and care of the disease.
4. The erection of a building or pavilion for tuberculosis as a part of the Kingston Public Hospital would provide a model for the conduct of similar additions to hospitals in other parishes. This pavilion should contain:—
   1. Ward beds for the care of not more than one hundred tuberculous patients.
   2. The central tuberculosis clinic of Kingston.
   3. An X-ray equipment for tuberculosis.
   4. A laboratory for tuberculosis. (Unnecessary if a public health laboratory were established.)

The advantages of collecting these activities in one building would be very great, since neither hospital nor dispensary can do effective work unless an X-ray laboratory is in immediate contact with it, only one X-ray laboratory is needed when hospital and dispensary are in the same building. Association of the tuberculosis hospital with the Kingston Public Hospital would diminish the overhead cost of its administration. The doctors (D.M.O's.) and nurses concerned with tuberculosis would have a period of service in this hospital and dispensary in preparation for their work.

The plan proposed assumes that the central tuberculosis hospital and clinic would be conducted by the central government. The wards for tuberculosis in outlying hospitals would be conducted under the same system as exising hospitals. The success of the plan would be dependent upon (a) unified administration of all tuberculosis activities and (b) adequate training of personnel.

The plan proposed would leave to the parishes (a) the establishment and maintenance of dispensaries for the recognition and home care of the disease, and (b) the maintenance of poor house infirmaries where indigent patients not suitable for hospital care would be segregated. These tuberculosis activities of the parish should be under the direction of the central tuberculosis administration or, as experience has already shown, their conduct will be ineffective.

Experience has already demonstrated that valuable aid may be provided by the Anti-Tuberculosis League and its branches established in the parishes. The most effective work that the League can do is the maintenance of tuberculosis nurses and provision of emergency relief of various kinds for persons and families whose support has been temporarily cut off by the disease. At the present time at least one nurse with special training in tuberculosis is needed in each parish to assist in the operation of the local tuberculosis dispensary, to visit accessible patients and to supervise the nursing in the tuberculosis ward of the parish (poorhouse) infirmary. In collecting funds for these purposes the Anti-Tuberculosis League conducts a highly effective educational campaign against tuberculosis.

Summary.

The outstanding features of the plan proposed are as follows:—

1. Organization of all tuberculosis work under one Director who shall have direction under the Superintending Medical Officer of (a) all tuberculosis hospital work, including parish infirmaries; (b) tuberculosis dispensaries, and (c) of tuberculosis registration.
2. Central Tuberculosis Clinic and Training School organized as part or unit of the Kingston Public Hospital under the Tuberculosis Director and consisting of (a) Wards for tuberculosis, (b) Central Tuberculosis Dispensary of Kingston, and (c) X-ray equipment.
3. Training of physicians (D.M.O.'s, etc.) engaged in tuberculosis work in dispensaries, hospital wards, and parish tuberculosis infirmaries, tuberculosis nurses, and some sanitary inspectors in the Central Tuberculosis Clinic of Kingston.
4. Maintenance of tuberculosis wards in hospitals outside of Kingston under medical control of the Tuberculosis Director.
5. Maintenance of dispensaries and parish infirmaries by the parish and under the medical control of the Tuberculosis Director.

VIII.—The Jamaica Yaws Commission.

The latest unit of co-operative public health work to be undertaken is the Yaws Commission organized in 1932. From the Colony's settlement by the English there are records that yaws has been a prevalent disease. Beginning 1920, Government made a systematic effort to control the infection through treatment by District Medical Officers, providing from £2,000 to £8,000 per year for this special purpose. But in 1929 the number of cases treated was larger than ever before and it was realized that the methods of attacking the problem would have to be enlarged and made more effective. So Government invited the Rockefeller Foundation to co-operate in a study of the disease from the public health aspect with the view of discovering the best ways of controlling it in the Island.

Dr. T. B. Turner of the faculty of the Johns Hopkins University School of Medicine was secured to direct the investigation and he arrived in Jamaica in January 1932, accompanied by Dr. G. M. Saunders who came to assist in the field work. Government appointed Dr. H. M. Johnston to be associated with the Commission. A central office and laboratory were established in Kingston, while a district about the village of Bath in St. Thomas parish was selected for the survey work. A staff was employed and a field office opened at Bath; men who had been trained in the Hookworm Commission and the Government Laboratory were secured for inspectors and laboratory assistants.

The Commission found early that much of the information concerning yaws, and particularly the manner in which the disease manifests itself in Jamaica, is unreliable as well as confusing. It was reported, for example, that the disease is limited to six or more fairly definite endemic areas located in districts having unusually high rainfall; a survey of the schools and investigation of groups in numerous places showed that the disease is not limited but very widespread through most of the mountainous parts of the Island. And there was but little reliable information regarding the effects of treatment and the ways in which the disease is spread.

During 1932 the field work was confined to districts about Bath, with a population of above 2,500. A method of survey was devised by which every home is visited and all infected cases located. A clinic was established with facilities for the examination of patients, dark-field examinations, collection of blood for serological studies, and other laboratory procedures. All but the simpler laboratory work had to be carried out in the central laboratory in Kingston where gas and electric current are available. Patients were transported to Kingston for X-ray studies of bone lesions and blood vessels. The work of 1932, to summarize, consisted of studies, clinical and epidemiological; an investigation of the relative merits of certain drugs; a comparative study of the Wassermann test, and the Eagle flocculation test in yaws; a study of the heart and aorta of yaws patients, with X-ray in addition to physical examinations; a study of the spinal fluid of yaws patients; X-ray investigations of bone lesions; and the isolation of *T. pertinue* in laboratory animals.

The study clinic at Bath was continued during the first three months of 1933, the main field office being moved to Seaforth also in St. Thomas, in April. From that time work in the Bath area was maintained to observe for a longer time the effects of treatment with different drugs and for the investigation of new infections. One day in each week was given to these activities, the staff spending the remainder of their time in treatment work in districts about Seaforth.

Up to the end of March 1933, when the field work was confined to Bath there was only one Government Medical Officer attached to the Commission; but in April Government provided a second Medical Officer and two units of treatment work were organized. Unit No. 1 which had been trained at Bath moved to St. Mary and the newly organized Unit No. 2 began work in the Seaforth area. As a matter of fact the work in St. Thomas, under the supervision of Dr. T. B. Turner, served as a training base for the medical officers and sanitary inspectors in methods of survey and treatment. And while primarily engaged in treatment the Units at Seaforth paid attention to research problems and worked in conjunction with studies being carried out at the central laboratory.

The clinical and epidemiological observations made up to March 1933 served as the basis for a plan of control work which has been found to be effective when applied in heavily infected districts during the last nine months of the year. Also the search for new facts was continued. These activities of the Yaws Commission may be set out by a description of the work of (1) The Research Unit; (2) The Treatment Units; and (3) The Central Laboratory.

1. *The Research Unit.*—As has already been stated, the Yaws Commission proposed to control the disease through treatment in heavily infected areas and to continue studies which do not have an immediate bearing upon control. At the beginning of its financial year, April 1, Government made provision for the salaries and travel of two medical officers for yaws treatment, as well as for drugs and stationery and printing. Because of the eagerness of the people for treatment and the interest of the local boards of health to extend treatment it was soon found that if the control units were to operate satisfactorily the only type of research work in which they could engage was a further study of the effectiveness of drugs and treatment methods. This made it desirable to have a separate clinic for the study of other problems and in October the staff was joined by a third local medical man, Dr. J. I. Rerrie, paid by the Foundation. This permitted the organization of a unit to give attention primarily to research problems; also it allowed treatment Unit No. 2 to remove to St. Mary parish.

The Research Unit during November and December continued studies in the Bath and Seaforth areas and opened a clinic at Pleasant Hill in St. Andrew parish. The problems being studied include: (1) The study of central nervous systems in yaws entailing spinal punctures; (2) Collection of histological specimens of representative yaws lesions by biopsy; (3) The study of cardiovascular involvement by clinical methods and X-ray; (4) Study of transmission from two angles (a) investigation of the circumstances surrounding each new infection which developed in the areas already subjected to control measures and in districts where the incidence of yaws is low, and (b) investigation of the role played by *Hippelates* flies; (5) study of new drugs; (6) Follow-up of old treated cases; (7) study of the reaction of patients in order to determine (a) if the skin lesions of yaws develop from a blood-borne virus or from direct inoculation from other infectious lesions and (b) if lesions could be produced in this manner so that a method for the investigation of transmission might be developed; and (8) comparative studies of yaws and syphilis.

It is evident that practically all of these problems require either the study of many patients who would not ordinarily be included in control work or they involve carrying out procedures distasteful to patients such as spinal punctures or biopsy, which would hamper the regular treatment campaigns.

As may have been gathered from what has been said, the progress of the research studies was retarded by lack of staff and the work of treating patients during the first nine months of the year. As a result of these, until the end of September the only purely research work was at Bath which consisted mainly of follow-up of old treated patients. In addition, a few spinal punctures were done, patients were X-rayed, and some histological material was obtained. One treatment day a week was held at the Bath office, the injections being given by the medical officer of Unit No. 2. In order to justify the use of this Government officer control work was at the same time carried out at Johnson Mountain, an adjacent district.

After Unit No. 2 moved from Seaforth in October, this area was taken over for the follow-up study of new infections. In December the area in St. Andrew was opened to secure more material, especially for a study of the blood calcium in bone yaws. This area will also be subjected to treatment since patients will not come to a clinic unless they are given treatment. Since October a clinic has been held at the Central Laboratory for the study of cases occurring in Kingston and for a comparative study of syphilitics. It is apparent that the work of the Research Unit will have to be carried on in several areas concurrently since one problem can best be studied in one area and another problem in another area.

During 1933 the Yaws Commission in St. Thomas added a population of 3,084 to the census in the areas in which work was conducted. A total of 1,881 treatments were given to 602 patients.

The Research Unit is under the direct supervision of Dr. T. B. Turner and the staff consists of a medical officer, a clerk, and two sanitary inspectors for field service. Dr. H. W. Kumm, of the staff of the Rockefeller Foundation, joined the Yaws Commission in November to conduct entomological and epidemiological studies in connection with the disease.

2. *The Treatment Units.*—Two Units of the Commission are engaged in treatment work which, with educational work and follow-up campaigns by local departments of health, are designed to control the disease. Besides giving relief to patients the object is to demonstrate methods by which yaws can be controlled and obtain detailed information as to the results of treatment with varying numbers of doses of neo-arsphenamine and bismuth.

Each Treatment Unit consists of a medical officer who directs the work of a "Survey Team" and a "Treatment Team." The survey team is composed of two specially trained sanitary inspectors. These go into an area selected for the campaign and make a house to house census, recording the name, age, sex, and race of each individual together with data on the history of yaws in each case. They also make an inspection of each person who has had yaws, noting the presence and type of any existing lesions. The two inspectors can survey a rural population of about 2,500 people in six weeks. The records of this work are utilized by the Treatment Team who come to the area when the survey is completed.

The Treatment Team is composed of the medical officer and four assistants. One assistant helps with treatment work, two sanitary inspectors see that the patients report for examination or treatment, and a clerk keeps the records. An office is established in the area and the patients who were located during the preliminary survey are notified when to come to the clinic.

The first week in each area is given to the examination of patients, and the remaining weeks to treatment. Hence, if six injections of either neo-arsphenamine or bismuth are given at weekly intervals, at least seven weeks will be required to complete the area. This, with the time taken up in moving from one area and settling in another, makes it necessary to give a minimum of eight weeks to the area.

A blood specimen is taken from each person at the first examination and again at the first treatment period. These are sent to the central laboratory for serological studies. Each team can treat about 75 patients daily with neo-arsphenamine (375 in a five day week); a greater number can be treated with bismuth, but this is limited by the number of patients who can be gone over during the examination period. Certain areas were treated with 6 weekly doses of neo-arsphenamine, others with 4 weekly doses; and still others with 6 or 4 weekly doses of bismuth. The dose of each drug is graduated according to body weight.

At first, examinations were made of all patients giving a history of yaws of 4 years duration or less, with or without lesions; all cases over 4 years duration showing infectious type lesions; and all cases with extensive destructive or incapacitating lesions of any type. It was found, however, that many cases of long duration with only slight non-infectious plantar lesions often become infectious; treatment is now given to all cases with yaws lesions of any type as well as to those having a history of four years duration or less.

About four months after the completion of an area the Treatment Team re-visits the area and treats new cases which may have developed or moved into the district and, also, cases which have relapsed. This follow-up campaign takes two weeks. Similar re-visists are planned after 8 or 10 months from the time the area was first treated. It is thought that after the lapse of a year the incidence of yaws in the heaviest infected areas will be so low that it can be easily controlled by the District Medical Officers. Experience has shown that careful follow-up campaigns are absolutely indispensable if control of the disease is to be accomplished.

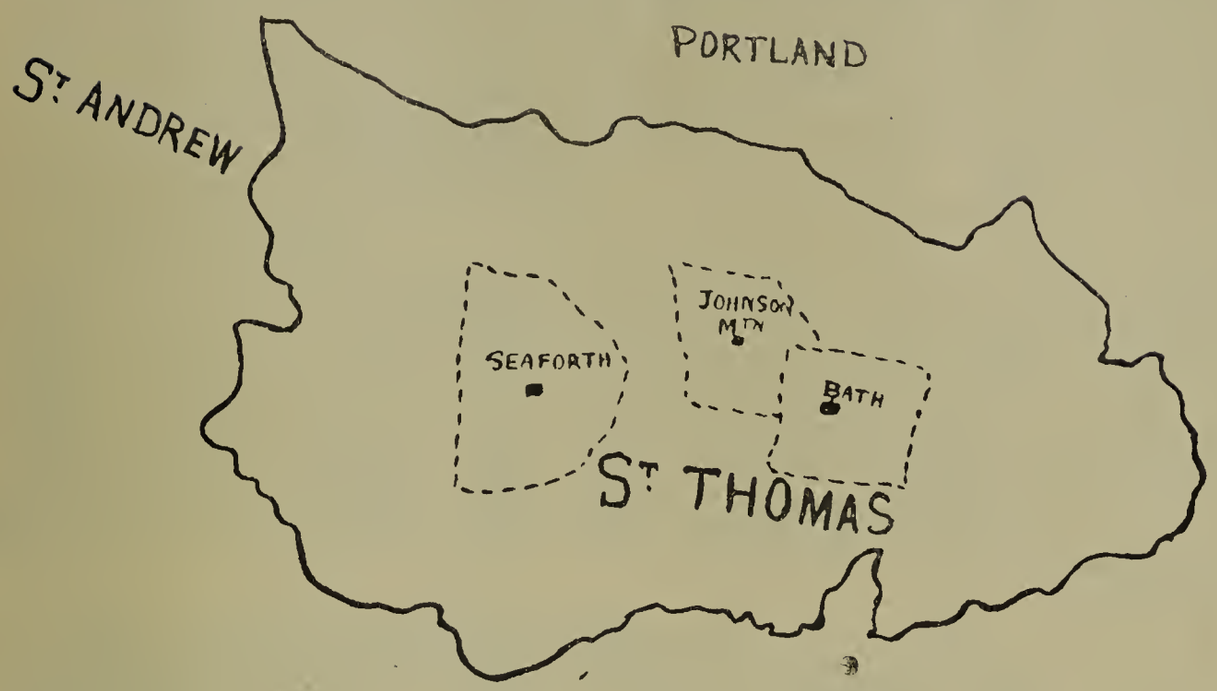
The treatment work is under the supervision of Dr. G. M. Saunders, the associated Government medical officers who carried out the treatment work being Dr. H. M. Johnston, until September; Dr. L. E. Arnold, since July; and Dr. J. I. Rerrie, since October. Unit No. 1 began work on April 1 and has surveyed and treated in the Castleton, Rock River, Richmond, and Brainerd areas and carried out follow-up campaigns in Castleton and Rock River. Also, they have surveyed the Belfield area. Unit No. 2 commenced work in the Clonmel area on October 1 and have completed survey and treatment work; also, by the end of the year the survey in the Broadgate area was finished.

It is estimated that each treatment unit can survey, treat, and follow-up in one year a population of from 15,000 to 20,000 where 60 per cent. of the people give a history of yaws.

The maps on pages 59 and 60 show the location of the areas surveyed and treated up to the end of the year. The plans for 1934 are for Unit No. 1 to do follow-up work in the Richmond area; then treatment work in Belfield area; then move into St. Catherine parish. Unit No. 2 will treat the Broadgate area, then the Enfield area; and afterwards move into Portland parish.

The table on page 61 gives the details of the treatment work done in each area during 1933.

Map of St. Thomas showing location of Areas of Yaws Work.



Map of St. Mary showing location of Areas of Yaws Work.

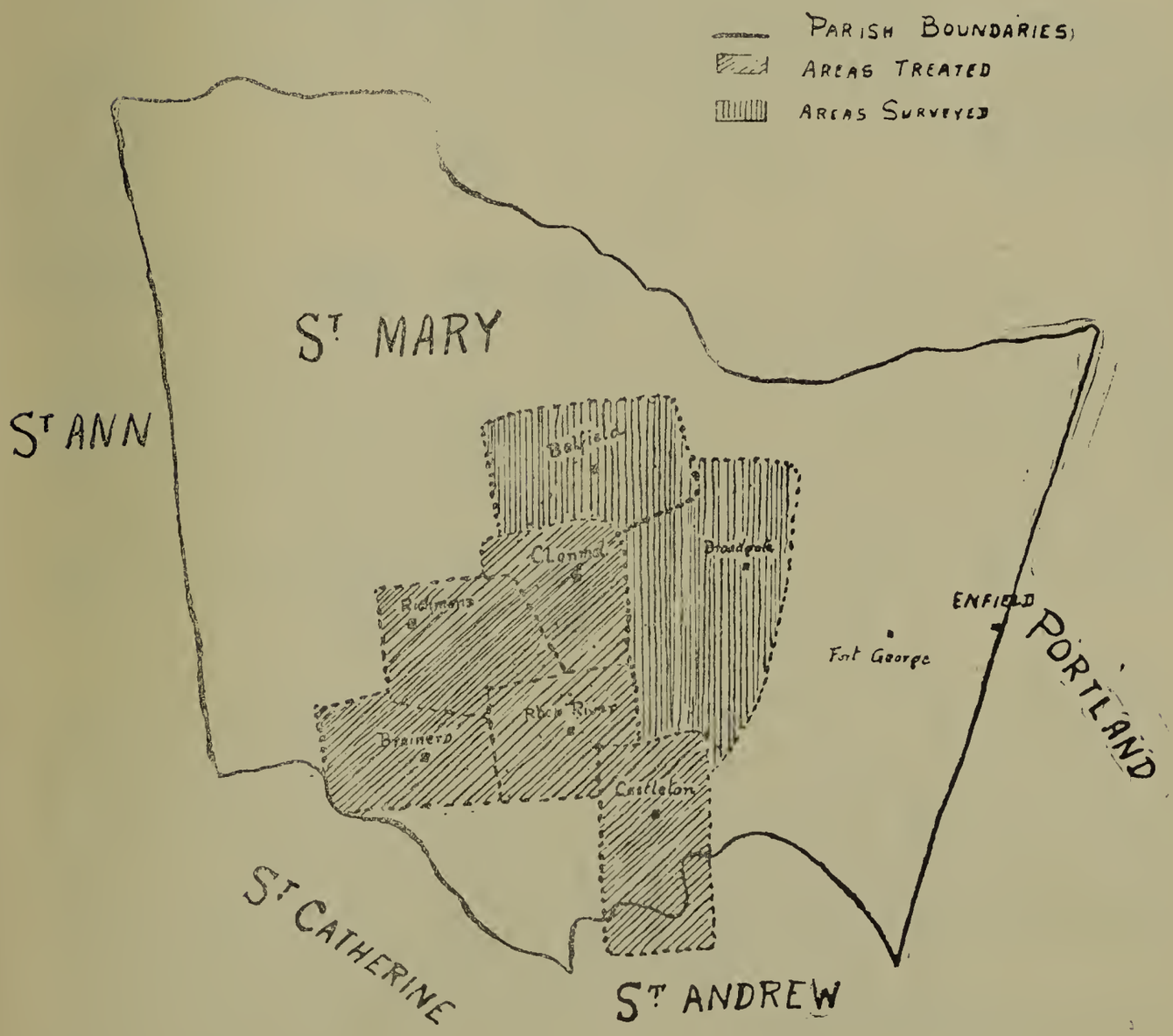


Table showing Treatment Work in St. Mary, April to December, 1933.

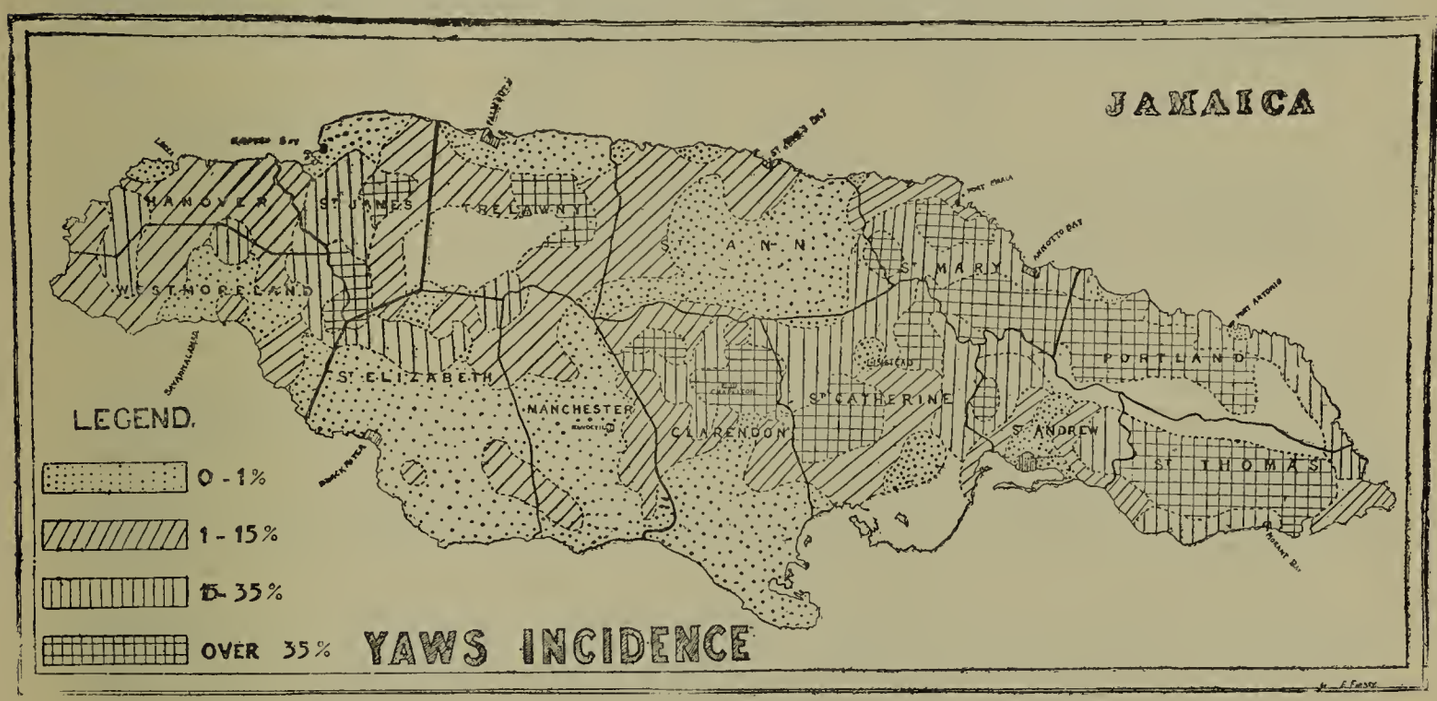
	Castleton.		Rock River.		Richmond.	Brainerd.	Clonmel	Broadgate.	Belfield.	Total.
	1st Period.	Follow up	1st Period.	Follow Up	——	——	——	——	——	
No. persons censused ..	1,717	..	2,014	..	3,781	2,657	2,470	1,850	2,600	17,089
No. with history of Yaws	1,056 (61%)	..	1,389 (69%)	..	1,606 (42%)	1,459 (55%)	1,320 (53%)	..	..	6,830
No. examined in Clinic ..	472	73	491	37	509	681	594	..	..	2,857
No. treated in Clinic ..	358	118	391	77	392	464	412	..	..	2,212
No. injections Neo-Arsphenamine	1,590	215	1,321	132	24	..	1,295	..	..	4,577
No. injections Bismuth salicylate ..	8	79	4	48	1,360	1,588	5	..	..	3,092
Dates of Survey ..	April 1 to May 20, 1933	..	May 20 to July 8th	..	July 3 to Sept. 9	Sept. 9 to Oct. 21	Oct. 1 to Nov. 14			
Dates of Treatment ..	April 15 to June 24 1933	Oct. 14 to Oct. 28	June 27 to Aug. 19	Oct. 28 to Nov. 11th	Aug. 22 to Oct. 14th	Nov. 15 to Dec. 23rd.	Nov. 4 to Dec. 23	No. 14 to Dec. 23rd.	Nov. 4 to Dec. 23rd.	
Plan of Treatment ..	6 Neo-Arsphenamine	..	4 Neo-Arsphenamine	..	6 Bismuth	4 Bismuth.	4 Neo–Arsphenamine	6 Bismuth	6 Neo-Arsphenamine	

3. *The Central Laboratory* of the Yaws Commission continued to operate in an efficient manner both in serving as an adjunct to the field work and in providing opportunities for laboratory investigations. The Wasserman complement fixation test and the Eagle flocculation test were made on over 15,000 blood specimens. Investigation of experimental yaws in laboratory animals was continued; strains of both syphilis and yaws were isolated and propagated in rabbits. The susceptibility of granulating wounds to infection with the yaws spirochete has been studied. Animal experimentation, however, was handicapped by an inadequate and uncertain supply of laboratory animals.

Since two Treatment Units have been in the field an enormous amount of laboratory work has had to be done in connection with the treatment work; this has left the technical staff with much less time to devote to work in connection with research problems.

The staff of the Central Laboratory consists of a technician, an assistant technician, a clerk, and caretaker and animal attendants.

In connection with the work of the different units of the Yaws Commission should be mentioned a survey carried out by Drs. Turner and Saunders to determine the incidence of the disease in different districts of the Island. Visits of inspection were made to all the parishes where the disease is very prevalent, reports of district medical officers were consulted, and Dr. Saunders prepared a questionnaire which was sent to schools through the Education Department. The results of this Survey are shown in the below. Subsequent visits to health departments and schools in the various parishes show the survey to be fairly accurate and of value in planning measures of control. If this survey could be supplemented by a serologic survey of individuals in a selected age group it is believed that it would yield information of great epidemiological value.



Another important event in connection with yaws control is the measure taken by the Central Board of Health to have districts in every parish surveyed and treated in accordance with a plan similar to the methods employed by the Treatment Unit. In each parish the local health department through the medical officers of health and the sanitary inspectors are made responsible for locating patients and seeing that these are given treatment by the district medical officers. This system of treatment is designed to control the disease in areas where only a small percentage of the population is infected; also, it will be used following the intensive campaigns of the Yaws Commission in the more heavily infected areas.

During 1933 the Yaws Commission succeeded (a) in organizing control work through treatment by a plan suitable for heavily infected areas; (b) continued important research studies and organized a Unit for enlarging these during 1934; (c) assisted Government in organizing control measures through the Health Departments and District Medical Officers; (d) made a survey of the incidence of the disease; and (e) carried out effective education work in regard to the disease, its spread and control.

IX.—Improvement of Public Water Supplies.

Since 1930 the Foundation has assisted Government in improving public water supplies by placing the services of Mr. E. H. Magoon, of the Foundation's staff, at the disposal of the Central Board of Health. Mr. Magoon arrived in the Colony in November, 1930, and remained for a year; and he has spent part of each succeeding year as a consultant to the local boards of health. His first work was with the Kingston and St. Andrew Corporation making a survey of the three filter plants and their distribution systems. This resulted in important changes being made in the layout of the plants and their distribution mains; improvements were made which led to more effective chlorination of the water after filtration; meters for the accurate measurement of the filtered water were correctly installed; and the organization of a Water Department in charge of engineers experienced in water supply problems—these were among improvements made to insure an adequate and safe supply of water. As a result of these changes daily bacteriological examinations of water samples show that the water supplied to the city during the past two years has been safe for drinking purposes.

During 1933, Mr. Magoon gave valuable assistance to the Water Department in the emergencies brought about by the storms which greatly damaged the water plants.

In addition to work with the Kingston and St. Andrew Corporation, upon the invitation of the parochial boards Mr. Magoon advised their local superintendents in regard to making improvements in the water supplies of Oracabessa in St. Mary; Spanish Town, Linstead and Old Harbour in St. Catherine; Montego Bay in St. James; Black River in St. Elizabeth; and May Pen in Clarendon.

X.—*Report of Unit No. 1 of the Jamaica Hookworm Commission for the year* 1933.

Section I.—The Year in Brief.

During the first six months of the year the Unit completed its activities in the Adelphi area, then transferred offices to Springfield in the John's Hall-Maroon Town area, where treatment campaign has been in progress until the present time.

The Adelphi area of approximately 90 square miles was divided into 15 districts, whilst the John's Hall-Maroon Town area, lying directly south of it, covers 90 square miles and has been divided into 16 districts. Work has been completed in 12 of these and it is expected to complete operations in the remaining 4 early in January of next year, when the Unit hopes to remove offices to Cambridge to commence treatment campaign in that area.

The following table shows the work accomplished by the Unit in both areas during the year:

Area.	Census.	First Exams.	Infected.	First Treats.	Total Treats.	Re-Exams.	Cured.
Adelphi ..	4,244	4,250	3,098	3,121	9,222	5,044	3,012
John's Hall-Maroon Town	12,007	11,995	9,386	8,529	23,002	12,026	8,032
Total ..	16,251	16,245	12,484	11,650	32,224	17,070	11,044

In addition to this, 1,238 private patients were examined and a total of 531 private treatments given to 211 patients. 1,013 private re-examinations were carried out. These figures include both areas.

The total figures for the Adelphi area, closed during the year, follow:—

Census.	First Exams.	Infected.	First Treats.	Total Treats.	Re-Exams.	Cured.
8,731 ..	8,705	5,454	4,877	13,635	7,187	4,458

The worm burden per person in the Adelphi area averaged 26.9.

Post Campaign work in these areas is now under consideration.

Treatment has been slightly modified. No Jalap was added to the capsules of chenopodium; other than this, the courses of chenopodium and thymol applying the "Intensive Method" to group treatment remains the same.

In the Laboratory the Willis Flotation Method was used for specimen examination and the stoll-technique for worm and egg-counts.

The sanitation of both area has been brought to a fair standard despite the ravages of two storms. In all, 39 new latrines were constructed and 108 insanitary ones made sanitary as follows:—Adelphi area 14 newly constructed, 87 insanitary made sanitary, John's Hall-Maroon Town area 25 newly constructed, 21 insanitary made sanitary.

The water supply has been variable—very short throughout the first five months of the year, and later very abundant, even accompanied with floods occasioning loss of property. The area towards the north (Adelphi) which is level and towards the coast, depends on catchments and tanks for its water supply, but the John's Hall-Maroon Town area has abundant springs and rivulets, most of them unprotected.

Communicable diseases, such as Chicken Pox, Yaws, Malaria seem particularly high in the wet and mountainous districts of the John's Hall-Maroon Town area. These are, however, to be met with in most of the districts of both areas, as well as Typhoid, Tuberculosis and the Venereal diseases.

It has been the interest of the Commission to concentrate on Public Health Education, especially in the districts of central St. James where hospital facilities and even medical aid is not easily accessible. The Unit has been aiding materially in bringing out for injections all Yaws suspects.

The co-operation of the people, on the whole, thanks to the influential members of the community, has been very satisfactory.

During the year a total of 45 public and school lectures were delivered to estimated audience of approximately 13,000, in addition to this 5 microscopical demonstrations were given to approximately 1,100 people.

Section II.—Description of Areas.

The general outline and history of the parish of St. James will be found in the Annual Report of this Commission for 1932. On a whole the Adelphi area is characterized by lowlands, the greater part of which is of sandy or loamy soil. A small part of the St. James range deviating from the main ridge, pushes its way to terminate along the south-eastern border.

The John's Hall-Maroon Town area offers the passage of that rugged ,wild and somewhat precipitous mountain known as the St. James Range; this is really a prolongation of the Cockpit Mountains beginning in St. Elizabeth and coursing in a north-westerly direction to terminate a little south of Montego Bay.

The John's Hall-Maroon Town area is bounded on the north by the Adelphi area, on the south and west by the Cambridge area and on the east by Trelawny. Roads are numerous, but from the nature of the country are often inaccessible to motor vehicles. Many villages, however, have but one outlet to their neighbour thus decreasing educational and social privileges.

Rainfall is, for the most part, abundant and rivers and springs numerous. Other than a small percentage of ground provisions, the people are chiefly engaged in the cultivation of bananas and this is the staple product. The soil is clayey and the extensive cultivations keep the earth damp for a considerable time. The climate is very cool, even in summer; often dense fogs follow the courses of the rivers.

The area has been divided into 16 districts: these are 1. Lottery; 2. Salter's Hill; 3. John's Hall; 4. Potosi; 5. Sunderland; 6. Camrose; 7. Springfield; 8 Maroon Town; 9. Hampton; 10. Kensington; 11. Tangle River; 12. Maldon; 13. Vaughansfield; 14 Summer Hill; 15. Barnett Bush; 16. Chatsworth.

Twelve of these have already been closed and it is hoped to complete operations in the remaining four early next year.

Nurse Gabay has been sent to pioneer the Cambridge area; treatment work will be started in this area in January.

The figures for the John's Hall-Maroon Town Area to date are as follows:—

Nos. Districts.	Census.	Examd.	Infected.	Treated.	Cured.	Under Treatment.
1–10. 14 & 15 (clsd.)	9,249	9,242	7,213	6,589	6,249	56
11. Tangle River	959	958	732	661	617	36
12. Maldon ..	685	683	536	488	457	29
13. Vaughansfield	783	783	611	547	515	31
16. Chatsworth ..	331	329	294	244	194	50
Totals	12,007	11,995	9,386	8,529	8,032	202

The towns of John's Hall, Springfield and Maroon Town share equal importance. John's Hall is the first relay in the chain of Post Offices from Montego Bay to Maroon Town. Springfield owes its importance to the large central school and church, Office of the Jamaica Hookworm Commission, a Record Office of Births and Deaths and, situated only one and one-half miles away, the Court House and Police Station of Springmount. It is an outstation of the D.M.O. for the Adelphi area and is 10 miles from Montego Bay.

Maroon Town is the last important district on the main road running through the area from Montego Bay, is 7 miles from the office of the Commission and 17 miles from Montego Bay. The district has quite an interesting history and received its name from the early Maroon Settlers. It was the centre of the Maroon War of 1795-96. Some century and a half ago, however, the Government took over the area to station a garrison of soldiers for the protection of the north-western coast of the Island. Several British Regiments were brought, the largest of these being the 97th. The garrison was "broken up" in 1885; the ruins of the cantonment can still be seen. The early Maroons received in exchange, a tract of land in northern St. Elizabeth in that mountainous Cockpit region known as "Look Behind" and their district, or reservation, is known as "Accompong."

A passing word, however, must be said of the district of Spring Vale, bordering Trelawny and lying four miles from Maroon Town on the road between the last named district and Falmouth. Mr. DePass, the owner of the property, keeps and runs an up-to-date dairy, manufactures butter and has a private ice factory. The whole plant is very commendable and is a model of what can be as near to the ideal in food production in the country parts. All water used is either pure rain water or boiled spring water and every article to touch or hold food products is sterilized.

Butter and milk from this plant are sent chiefly to Montego Bay and Falmouth for sale.

Population and Housing.

The population of the John's Hall-Maroon Town area is larger than that of the Adelphi area; 12,007 as against 8,731.

Although there is a fair amount of the labouring class working on large banana cultivations, the majority of the people are "small settlers" and consequently more prosperous than those of the Adelphi area.

Homes, although overcrowded, are mainly made of lumber. There are 1,722 homes in the Adelphi area of a population of 8,731 giving an average of 5 persons per home. There are 2,598 homes in the John's Hall-Maroon Town Area of a population of 12,007 giving an average of 4.6 persons per home.

Sanitation and Communicable Diseases.

The Sanitation Unit completed its work in the three areas under our control. Unfortunately, added to the ravages of the storm of November, 1932, there has been destruction of property in the two recent storms of October, 1933, and further undoing of their work which was very good in this area.

All latrines are of the pit type. In the Adelphi area, during the operations of the Commission the percentage of the insanitary and absent latrines fell from 11% to 9%. 14 new latrines were constructed and 87 insanitary made sanitary.

In the John's Hall-Maroon Town area, the recent storm damage to latrines runs from 5–10% varying with location. 25 new latrines have been built and 21 insanitary made sanitary since our arrival.

The final figures and latrine classifications of the closed districts of both areas follow:—

Adelphi Area.

No. District.	Census.	Examd.	Infected.	% Infected.	Treated	Cured.	Discon-tinued.	Under Treatment.
1. Adelphi ..	377	377	212	56.2	191	183	6	2
2. Barrett Town ..	577	575	143	24.8	125	115	5	5
3. Dumfries ..	680	680	464	68.2	420	408	9	3
4. Chatham ..	358	358	203	55.6	181	166	11	4
5. Rose Hall ..	768	761	345	45.3	270	193	22	55
6. Orange ..	639	637	335	52.1	280	248	21	11
7. Whyms Road ..	500	494	358	72.4	314	275	35	4
8. Blytheston ..	241	240	140	58.3	116	97	10	9
9. Goodwill ..	362	362	169	46.6	145	144	..	1
10. Somerton ..	1,100	1,097	763	69.5	700	660	34	6
11. Yorkland ..	544	544	466	85.4	427	360	59	8
12. Paisley ..	549	549	338	61.1	319	301	10	8
13. Hurlock ..	604	600	412	68.6	362	347	10	5
14. Industry ..	694	694	548	78.9	523	475	40	8
15. Bull Pen ..	738	737	558	75.7	504	486	11	7
Totals ..	8,731	8,705	5,454	62.6	4,877	4,458	293	136

John's Hall-Maroon Town Area.

No. District.	Census.	Examd.	Infected.	% Infected	Treated.	Cured.	Discontinued.	Under Treatment.
1. Lottery ..	718	718	601	83.7	557	539	15	3
2. Salter's Hill ..	871	869	672	77.3	586	523	50	13
3. John's Hall ..	773	773	587	77.3	539	484	41	14
4. Potosi ..	814	813	620	76.2	561	515	37	9
5. Sunderland ..	861	860	718	83.4	661	643	14	4
6. Camrose ..	827	827	504	60.9	453	442	8	3
7. Springfield ..	1,063	1,062	818	77.0	753	731	20	2
8. Maroon Town ..	859	858	724	84.2	671	638	33	..
9. Hampton ..	642	641	469	73.1	422	409	13	..
10. Kensington ..	853	853	720	84.4	681	654	25	2
14. Summer Hill ..	630	630	520	82.5	476	453	19	4
15. Barnett Bush ..	338	338	260	76.9	229	218	9	2
Totals ..	9,249	9,242	7,213	78.0	6,589	6,249	284	56

Adelphi Area.

No. District.	No. of Homes.	First Classification.			Last Classification.		
		D.	E.	F.	D.	E.	F.
1. Adelphi ..	74	61	9	4	64	5	5
2. Barrett Town ..	133	122	1	10	125	..	8
3. Dumfries ..	158	80	69	9	98	51	9
4. Chatham ..	82	61	17	4	71	7	4
5. Rose Hall ..	98	97	..	1	89	2	7
6. Orange ..	132	105	17	10	116	9	7
7. Whym's Road ..	94	66	4	24	66	5	23
8. Blytheston ..	58	50	4	4	43	9	6
9. Goodwill ..	89	75	10	4	67	18	4
10. Somerton ..	193	124	49	20	133	40	20
11. Yorkland ..	107	48	30	29	53	28	26
12. Paisley ..	105	57	16	32	66	10	29
13. Hurlock ..	125	82	19	24	92	10	23
14. Industry ..	118	87	22	9	96	12	10
15. Bull Pen ..	156	105	37	14	116	27	13
Totals ..	1,722	1,220	304	198	1,295	233	194

John's Hall-Maroon Town Area.

No. District.	No. of Homes.	First Classification.			Last Classification.		
		D.	E.	F.	D.	E.	F.
1. Lottery ..	133	105	13	15	102	17	14
2. Salter's Hill ..	184	115	31	38	128	26	30
3. John's Hall ..	174	132	16	26	139	11	24
4. Potosi ..	215	122	57	36	128	53	34
5. Sunderland ..	191	126	15	50	129	11	51
6. Camrose ..	157	142	1	14	145	..	12
7. Springfield ..	210	164	16	30	169	15	26
8. Maroon Town ..	190	100	30	60	92	27	71
9. Hampton ..	144	98	5	41	101	6	37
10. Kensington ..	182	149	9	24	135	19	28
*11. Tangle River	201	106	61	34	..	..	..
*12. Maldon ..	168	115	22	31	..	..	..
*13. Vaughansfield ..	164	100	16	48	..	..	..
14. Summer Hill ..	138	90	17	31	72	21	45
15. Barnett Bush ..	67	55	3	9	59	1	7
*16. Chatsworth ..	80	47	7	26	..	..	..
Totals ..	2,598	1.766	319	513	1,399	207	379

* With regard to these districts, no figures appear under 'Last Classification' as they are still under operation and not yet closed.

Communicable diseases in both areas still take a great percentage of deaths. Typhoid Fever, Yaws, Malaria, Chicken Pox, Tuberculosis and Venereal Diseases are among the foremost hindrances and dangers to be encountered around these districts.

Malaria is particularly prevalent at Endeavour, Springmount, John's Hall, Vaughansfield, Tangle River and Yorkland. In many instances a small amount of quinine has to be doled out so as to enable those infected to receive Hookworm treatment.

Typhoid Fever has occurred sporadically in Endeavour, Barnett Bush, Salter's Hill and Vaughansfield.

Yaws is particularly prevalent around the districts of Maroon Town, Silver Grove Mountains, Springfield, Hampton and Summer Hill, but is to be found in almost every district of the John's Hall-Maroon Town area. Every effort is being made by the Commission in helping the M.O.H. and D.M.O. for the areas to bring out all cases of Yaws (open lesions and latent cases) to receive regular and full courses of injections.

The following figures show the incidence of Yaws in the area:—

Lottery 5; Salter's Hill and Flamstead 17; John's Hall 1; Potosi 3; Sunderland 20; Camrose 1; Springfield 92; Maroon Town 3; Hampton and Endeavour 27; Kensington and Point 7; Tangle River 18; Maldon 23; Vaughansfield 13; Summer Hill, Brown Hill and Carlton Mtns. 96; Barnett Bush 27; Silver Grove Mtn. 16; Burke's Mtn. 8; Adelphi Mtn. 9; Spring Gardens 2.

The Sanitary Inspector is informed, from time to time through the M.O.H. of cases of Communicable Diseases and his co-operation obtained whenever possible.

The importance of boiling milk and drinking-water has been stressed especially in this area (John's Hall-Maroon Town) where so many unprotected rivulets exist.

Water Supply.

As described in the Annual Report for 1932, the water supply varies greatly over different parts of the parish and even more so in different seasons of the year.

The northern section of the parish, that is, the northern two-thirds of the Adelphi area suffers greatly from water shortage and the chief means of supply is in tanks and catchments, many of which are "public" and protected by the Parochial Board.

The lower third of the Adelphi area and the whole of the John's Hall-Maroon Town enjoy an abundant water supply from numerous springs, rivulets and private tanks. Unfortunately only a few of these are protected and not only does pollution occur, but often stagnation with its resultant evil of fostering breeding places for the Malaria Mosquito.

The Montego River itself, rises in trap formation near Maroon Town where it is known as Tangle River, and after being joined by various tributaries and springs flows tortuously through the fertile Montego Valley eventually emptying itself into the sea not far south of Montego Bay.

During the first six months of this year there was a severe drought followed by torrential rains and, as elsewhere mentioned, two storms accompanied with floods. Great has been the suffering in the wake of the storm, especially in the parishes of St. Elizabeth, Westmoreland, Hanover and St James.

Educational Campaign and Co-operation.

The co-operation of the people of the John's Hall-Maroon Town area and the Adelphi area has been good on the whole. Except for a few isolated places as Salter's Hill (where a patient died of Typhoid Fever), Yorkland and Brown Hill which are "blind districts," the people turned out in full force for treatment. Unfortunately, malaria caused some set-back in John's Hall, Tangle River and Vaughansfield, stagnant water being at the root of the trouble in these cases.

The Commission wishes to thank the members of the Parochial Board, Pastors and Teachers and other influential members of the communities in which we have worked, especially Hon. P. F. Lightbody, M.L.C.; Mr. A. B. Lowe, Vice-Chairman Parochial Board; Mr. J. Hastings, M.P.B.; Mr. T. Reid, M.P.B.; Mr. E. Perkins, M.P.B.; Dr. F. E. Lowe, M.O.H.; Dr. E. S. Greaves, D.M.O.; Rev. J. A. Dyer, Rev. J. A. Jones, J.P.; and many others, not only for their attendance and participation in our lectures but, for their help in the diffusion of health knowledge and their influence among the people they serve.

Unfortunately, on account of the torrential rains Health Week was completely washed out in both areas. Education Week was, however, fittingly observed by two lectures at Springfield by the Medical Director and Chief Clerk respectively.

The intensive educational programme of the Commission in all public health matters has been stressed this year. Special help and interest have been given to yaws, malaria and venereal diseases. At present besides posters, leaflets, bulletins and placards illustrating and giving information about the prevention of diseases, one day each week is devoted by the Nurses to warn and bring out for injection all patients suffering from yaws.

During the year 45 lectures were given to estimated audiences of 13,000 people.

The following table gives the lectures in detail:—

Adelphi Area.

Date.	Place.	Material.	Lecturer.	Attendance.
Janauary ..	Somerton	Lantern Lecture	Dr. Sinclair	500
	Whym's Road	do.	do.	300
	Goodwill	do.	do.	250
	Dumfries	do.	do.	350
	Somerton Sch.	Municipal Demonstration	Mr. Heslop	150
February ..	Mt. Zion	Lantern Lecture	Dr. Sinclair	200
	Paisley	do.	do.	200
	Yorkland	Municipal Demonstration	Mr. Heslop	150
March ..	Mt. Zion	Venereal Diseases	Dr. Sinclair	300
	Hurlock	Lantern Lecture	do.	300
	Yorkland	do.	do.	250
	Industry	do.	do.	400
	Bull Pen	Chart Lecture	Mr. E. Banks	172
April	Industry	Lantern Lecture	Dr. Sinclair	200
May ..	Bull Pen	Lantern Lecture	Dr. Sinclair	200
	Lucea (Hanover)	Special Lecure	Dr. Sinclair	300

John's Hall-Maroon Town Area.

Date.	Place.	Material.	Lecturer.	Attendance.
May ..	Salter's Hill	Lantern Lecture	Dr. Sinclair	400
	Lottery	do.	do.	200
	Flamstead	do.	do.	300
	Sunderland Sch.	Chart Lecture	Mr. N. Gabay	130
	Buckingham Sch.	do.	do.	125
	Kensington Sch.	do.	do.	95
	Springfield	do.	do.	70
	John's Hall	Municipal Demonstration	Mr. Heslop	466
	Salter's Hill	do.	do.	58
June ..	St. Luke's Sch.	Chart Lecture	Mr. N. Gabay	150
	Springfield Sch.	Education	Dr. Sinclair	500
	do.	do.	Mr. A. Lindo	120
July ..	John's Hall	Hookworm Disease and Child Welfare	Dr. Sinclair / Dr. Vernon	300
	Springfield	do.	do.	650
August ..	Camrose	Lantern Lecture	Dr. Sinclair	500
	Potosi	do.	Mr. A. Lindo	150
	Kensington	Municipal Demonstration	Mr. O. Levy	250
September	Tangle River	Sanitation ..	Mr. A. Lindo	680
	Maldon	do.	do.	495
	Vaughansfield	do.	do.	523
	Summer Hill	do.	do.	302
October ..	Maroon Town	Lantern Lecture	Dr. Sinclair	500
	Barnett Bush	Sanitation	Mr. A. Lindo	280
	Chatsworth	do.	do.	200
November	Maldon	Lantern Lecture	Dr. Sinclair	300
	Tangle Wiver	do.	do.	500
	Kensington	do.	do.	300
	Springfield	Yaws	do.	250
December ..	Vaughansfield	Lantern Lecture	do.	150
	Barnett Bush	do.	Mr. A. Lindo	250
	Summer Hill	do.	Dr. Sinclair	350
	Springfield	Venereal Diseases	do.	100

Cambridge Area.

November ..	Pear Tree Hill Sch.	Chart Lecture	Mr. N. Gabay	82
December	Catadupa School	do.	do.	104

Section III.—Treatment Campaign.

Slight changes in our routine "Group" Treatment has been in progress during the year in both areas, but the "Intensive Method" is still by far the best and cheapest. Due to the high returns of the per capita cost per cure and per treatment, the number of persons censused and treated by each nurse was increased from 300–500 to 700–900 within the same given period of approximately 12 weeks. This method cut the per capita cost almost in two.

The other change effected was to give the chenopodium in capsule form without Jalap, thus allowing the drug to act longer in the intestine when given as a first treatment. The results have been striking and the percentage of cures rose after each course of treatment. The average percentage of cures now obtained throughout the districts after the first two treatments is 67.3%. Cures after third and fourth treatments have increased 5–10% average, thus making an average of 70%.

Due to the high incidence of communicable diseases, it has again been decided to cut down the number of patients to be treated by each nurse in a given time to 400, so as to aid the thorough dissemination of public health knowledge and individual instruction even at the expense of a slightly higher per capita cost.

It will be noted that the percentage of residual infection is particularly high in the John's Hall-Maroon Town area. This is partly due to the frequent removal and migration of the population to and from the important town of Montego Bay which is only 10 miles away, and to and from the various properties around, also partly to the high incidence of Malaria and Yaws. In many instances the latter conditions exist in a latent state and seem to flare up after the first two treatments.

Fortunately there have been no cases of serious illness or death following treatment in any district. From time to time, however, patients are encountered complaining of Epigastric Pain and distress especially following the ingestion of Thymol.

Arrangements are now being made to carry out the necessary Post Campaign Treatment and Sanitation in the areas worked by the Commission.

Work of the Nurses.

Although there have been slight changes, and sometimes a shortage of our Field Officers, the work in the field has kept up to a high standard throughout the year.

Where results have been poor, or percentage of cures low in most cases the causes can be traced to local conditions or bad weather, severe infection averaging over 80%, the type of soil and cultivation met with and much communicable disease.

Nurse Ramsay was temporarily assigned to the Tuberculosis Commission for one month (June 19th to July 18th). Nurse Banks, who had been absent for the early part of the year attending the School for Sanitary Inspectors, returned in March and following his outstanding work was promoted as a Field Officer of the Malaria Commission.

Mr. Hyman of the latter department was transferred to the Hookworm Commission, and after field training of one week was allotted a district for trial.

The educational aspect of Public Health Work has been their chief feature during the year, and in each district lectures and house to house talks have been given by them.

The following table compares their results in both areas:—

Adelphi Area.

Nurse.	District Nos.	No. of actual working days.	Percentage Cures.	Av. Percentage of Cures (closed Districts.)
G. V. Ramsay	1	69	95.8	
	9	60	99.3	97.5
E. R. Banks	3	31	97.1	
	15	82	96.4	96.7
T. W. Patterson	3	42	97.1	
	11	77	84.3	95.7
F. J. Fletcher	6	92	88.5	
	13	74	95.8	92.1
C. N. Gentles	7	96	87.5	
	14	66	90.8	89.1
H. M. Gray	4	84	91.7	
	8	22	83.6	87.6
G. E. Richards	2	62	92.0	
	8	35	83.6	
	12	71	94.3	86.6
N. S. Gabay	5	60	71.4	
	10	88	94.2	82.8

John's Hall-Maroon Town Area.

E. R. Banks	7	69	97.0	97.0
F. J. Fletcher	5	94	98.7	
	*13	97	94.1	96.4
C. N. Gentles	6	90	97.5	
	14	85	95.1	96.3
G. V. Ramsay	1	85	96.5	
	10	113	96.0	96.2
N. S. Gabay	8	106	95.0	95.0
H. M. Gray	2	112	89.2	
	9	67	96.9	
	15	58	95.1	93.7
T. W. Patterson	4	100	91.7	
	*11	87	93.3	92.5
G. E. Richards	3	98	89.7	
	*12	88	93.6	91.6
*R. J. Hyman	*16	55	79.5	79.5

* These districts are still under operation.

From the figures it may be concluded that in the Adelphi area a nurse completed a census of 500 having an infection of 400 in 12 weeks. In the John's Hall-Maroon Town area a nurse completed a census of 800 having an infection of 600 in 12 weeks.

No nurse was discharged during the year.

Private Treatments.

This mode of treatment in the Adelphi area was almost negligible, only five cases were thus treated for the year. The population there has been fairly stable and the census by each nurse small.

In the John's Hall-Maroon Town area the number has increased to some extent, due, as has already been noted, to the migratory population. The small districts of Burke's Mountain and Adelphi Mountain which were not grouped in our regular districts for treatments—due to poor sanitation—have been under treatment as "privates" by Nurse Ramsay. A total of 521 treatments were given to 206 private patients. These figures include private treatments given from office.

In the Adelphi area, the districts of Dover and Palmyra were not treated due to lack of proper sanitation.

Incidence of Hookworm Infestation.

Hand in hand with the heavy rainfall, clayey soil and banana cultivation goes the high infection of hookworm and other communicable diseases.

In the Adelphi area where the great number of districts were in cane and cocoanut cultivation, and the soil sandy, the percentage of infection was variable but not very high. It varied from 24.8% in District No. 2 Barrett Town to 85.4% in District No. 11 Yorkland, with an average of 62.6%. The following table gives the percentage in detail:—

No.	District.	Examined.	Infected.	Per cent. of Infection.
1.	Adelphi	377	212	56.2
2.	Barrett Town ..	575	143	24.8
3.	Dumfries ..	680	464	68.2
4.	Chatham ..	358	203	56.6
5.	Rose Hall ..	761	345	45.3
6.	Orange ..	637	335	52.1
7.	Whym's Road ..	494	358	72.4
8.	Blytheston ..	240	140	58.3
9.	Goodwill ..	362	169	46.6
10.	Somerton ..	1,097	763	69.5
11.	Yorkland ..	544	466	85.4
12.	Paisley ..	549	338	61.1
13.	Hurlock ..	600	412	68.6
14.	Industry ..	694	548	78.9
15.	Bull Pen ..	737	558	75.7

In the John's Hall-Maroon Town area the incidence of Hookworm infection was very high despite the fact that sanitation was fairly good, especially in the districts of Camrose and Barnett Bush. Rainfall here is very abundant, the soil of rich clay and the cultivations essentially bananas, yams and cocoas.

The incidence of Hookworm Disease here varies from 60.9% in district No. 6 Camrose to 89.3% in district No. 16 Chatsworth with an average of 78.2%. The figures for each district are as follows:—

No.	District.	Examined.	Infected.	Percentage of Infection.
1.	Lottery ..	718	601	83.7
2.	Salter's Hill ..	869	672	77.3
3.	John's Hall ..	773	587	77.3
4.	Potosi ..	813	620	76.2
5.	Sunderland ..	860	718	83.4
6.	Camrose ..	827	504	60.9
7.	Springfield ..	1,062	818	77.0
8.	Maroon Town ..	858	724	84.2
9.	Hampton ..	641	469	73.1
10.	Kensington ..	853	720	84.4
11.	Tangle River ..	958	732	76.4
12.	Maldon ..	683	536	78.4
13.	Vaughansfield ..	783	611	78.0
14.	Summer Hill ..	630	520	82.5
15.	Barnett Bush ..	338	260	76.9
16.	Chatsworth ..	329	294	89.3
	Totals	11,995	9,386	78.2

In the Adelphi area the average worm burden per person was 26.9%. The figures for the area follow:

No.	District.	No. egg counted.	Lowest No. worms found.	Highest No. worms found.	Av. No. of worms per infected person.
1.	Adelphi	12	4.5	31.8	16.5
2.	Barrett Town	12	2	68.1	17.9
3.	Dumfries	15	2	40.9	13.8
4.	Chatham	18	2	59	17.4
5.	Rose Hall	7	2	13.6	6
6.	Orange	8	2	59	16.3
7.	Whym's Road	5	4	36.3	10.2
8.	Blytheston	9	9	27.2	17.1
9.	Goodwill	6	9	36.3	19.4
10.	Somerton	18	2	490.8	65.5
11.	Yorkland	8	4.5	231.8	74.5
12.	Paisley	10	2	45.4	18.9
13.	Hurlock	9	2	90.9	26.9
14.	Industry	8	4.5	140.8	55.6

The following tables show the percentage of infection relative to a. Age Groups, b. Sex, in both areas.

Adelphi Area.

Age Group.	Examd.	Infected.	Percentage.
0 – 5 yrs.	1,195	314	26.2
6 – 10 "	1,245	701	56.3
11 – 20 "	1,908	1,408	73.7
21 – 30 "	1,808	1,341	74.1
31 – 40 "	1,013	676	66.7
41 – 50 "	795	527	66.2
51 – 60 "	432	281	65.0
Over 60 "	309	206	66.6
Totals	8,705	5,454	62.6

John's Hall-Maroon Town Area.

Age Group.	Examined.	Infected.	Percentage.
0 – 5 yrs.	1,622	662	40.8
6 – 10 "	1,686	1,304	77.3
11 – 20 "	2,608	2,283	87.5
21 – 30 "	2,817	2,467	87.5
31 – 40 "	1,426	1,179	82.6
41 – 50 "	977	782	80.0
51 – 60 "	493	412	83.5
Over 60 "	366	297	81.1
Totals	11,995	9,386	78.2

Adelphi Area.

Sex.	Examined.	Infected.	Percentage.
Male	4,169	2,711	65.0
Female	4,536	2,743	60.4
Totals	8,705	5,454	62.6

John's Hall-Maroon Town Area.

Sex.	Examined.	Infected.	Percentage.
Male	5,999	4,925	82.0
Female	5,996	4,461	74.3
Totals	11,995	9,386	78.2

It will be noted that the greatest rate of worm acquisition is between 1–10 yrs., then the rate of acquisition slowly falls off until the age of 30 is reached where the percentage of infection is highest.

Infection is higher among males than among females.

The above conditions could be explained from the fact that 1. In youth the person is more often barefooted than otherwise. 2. More polluted soil in and around the neighbourhood of the yards than that in the fields. 3. Cleaner habits with increasing age. 4. Males are more often without shoes than females for all ages. 5. The males do the greater part of traversing the yards, bushes and cultivated fields.

After the age of 30 there is a slow decline in worm infestation, possibly due to better housing, sanitation and financial circumstances. As treatment is rarely ever done without some other condition intervening the rate of worm loss is very slow and often complicated by tolerance and re-infection. (See Graphs.)

The following tables show the percentage cured after each examination.

Adelphi Area.

Examination.	No. Examined.	No. Cured.	Percentage.
2nd. Exam.	4,825	3,063	63.5
3rd. "	1,658	1,064	64.1
4th "	515	253	49.1
5th "	161	66	40.9
6th "	27	12	44.4
7th "	1	..	..

John's Hall-Maroon Town Area.

Examination.	No. Examined.	No. Cured.	Percentage.
2nd Exam.	6,549	4,410	67.3
3rd "	2,040	1,426	69.9
4th "	568	348	61.2
5th "	106	60	66.6
6th "	9	5	55.1

N.B.—The figures for the John's Hall-Maroon Town area are for the closed districts only.
In the following tables are shown, in continuous figures the percentage of cures after each examination.

Adelphi Area.

No. Treated.	Cured after 2nd Exam.	Percentage.	Cured after 3rd Exam.	Percentage.	Cured after 4th Exam.	Percentage.	Cured after 5th Exam.	Percentage.	Cured after 6th Exam.	Percentage.	Total Cured.	Percentage.
4,877	3,063	63.5	4,127	84.6	4,380	89.8	4,446	91.1	4,458	91.4	4,458	91.4
					John's Hall-Maroon Town Area.							
6,589	4,410	66.9	5,836	88.5	6,184	93.8	6,244	94.7	6,249	94.8	6,249	94.8

N.B.—The figures for the John's Hall-Maroon Town area are for the closed districts only.

It has been the custom to discontinue treatment after 5 treatments if the person still remains positive, but as many as 7 treatments have been given in special circumstances. In the Adelphi area 166 6th and 28 7th treatments were given; in the John's Hall-Maroon Town area 99 6th and 11 7th treatments were given in the closed districts.

The residual infection in the Adelphi area was divided as follows:—Positive not treated 577; discontinued after treatment 283; left under treatment 136; total 996 or 18.2% of the infected. That of the closed districts in the John's Hall-Maroon Town area is as follows:—Positive not treated 624; discontinued after treatment 284; left under treatment 56; total 964 or 13.3% of the infected.

A total of 443 patients were not treated for medical reasons in the Adelphi area, these are classified as follows:—yaws 6; paralysis 3; V.D. 8; tuberculosis 4; prolapsed rectum 1; with young baby 15; rheumatism 1; bad kidneys 5; heart disease 11; pregnant 115; senile debility 100; goitre 1; idiotic 1; stricture 1; typhoid 1; unclassified 170.

In the closed districts of the John's Hall-Maroon Town area 549 patients were not treated for medical reasons. The figures follows:—Pregnant 175; heart disease 49; senile debility 157; yaws 38; stricture 1; insanity 3; malaria 6; paralysis 9; bad kidneys 5; rheumatism 4; tuberculosis 4; with young baby 32; V.D. 25; fits 1; blind 1; appendicitis 1; gastritis 1; Graves disease 4; crippled 3; goitre 3; hernia 1; unclassified 26.

Incidence of other Helminths.

The following table gives the incidence and percentage of other intestinal worms noted during the routine stool examination. Prevention of these worms is similar to that for hookworms.

Adelphi Area.

District No.	Exam'd.	Ascaris.	Percentage.	Trichocephalus	Percentage.	Strongyloids.
1. ..	377	154	43.5	169	47.4	
2. ..	575	154	27.2	80	13.7	
3. ..	680	159	23.3	163	23.9	1
4. ..	358	60	16.7	73	20.3	2
5. ..	761	132	17.3	107	14.0	..
6. ..	637	117	18.3	112	17.5	4
7. ..	494	131	26.5	138	27.9	1
8. ..	240	119	49.5	116	48.3	1
9. ..	362	132	36.4	153	42.2	1
10. ..	1,097	235	21.4	214	19.5	1
11. ..	544	101	18.5	174	31.9	..
12. ..	549	117	21.3	102	18.5	..
13. ..	600	127	21.1	106	17.6	..
14. ..	694	130	18.7	140	20.1	..
15. ..	737	233	31.6	227	30.8	1
Totals ..	8,705	2,101	24.1	2,074	23.8	12

John's Hall-Maroon Town Area.

District No.	Exam'd.	Ascaris.	Percentage.	Trichocephalus.	Percentage.	Strongyloids.
1. ..	718	123	17.1	194	27.0	
2. ..	869	124	14.3	99	11.3	
3. ..	773	112	14.4	136	17.7	
4. ..	813	777	9.4	152	18.6	
5. ..	860	23	2.6	84	9.7	
6. ..	827	89	9.7	103	12.4	
7. ..	1,062	123	11.5	323	30.3	
8. ..	858	190	22.1	369	43.0	
9. ..	641	193	30.1	224	34.9	
10. ..	853	162	19.0	288	33.7	
11. ..	958	241	25.1	447	46.6	
12. ..	683	157	22.9	268	38.7	
13. ..	783	247	31.8	353	45.4	
14. ..	630	112	18.1	250	40.7	
15. ..	338	99	29.2	168	49.7	
16. ..	329	86	26.1	137	41.6	
Totals ..	11,995	2,158	17.9	3,595	29.9	

Statistics of Adelphi Area—Districts 1 – 15.

1. Census		8,731
a. No. removing before examination ..	12	
b. No. dying before examination ..	2	
c. No. not located for examination ..	2	
d. No. refusing examination	9	
e. No. not examined for no reason ..	1	
2. Number available for examination		8,705 or 99.7%
3. Number examined		8,705 " 99.7%
4. Number found infected		5,454 " 62.6%
a. No. not treated for medical reasons ..	443	
b. No. removing before receiving treatment	69	
c. No. dying before receiving treatment ..	3	
d. No. not located for treatment ..	1	
e. No. refusing to take treatment ..	9	
5. Number available for treatment		4,929 or 90.3%
6. Number treated		4,877 " 98.9%
a. Number discontinued for medical reasons	32	
b. No. removing before being cured ..	64	
c. No. not located for further treatment ..	4	
d. No. refusing further treatment ..	6	
e. No. discontinuing after five or more treatments	176	
f. No. dying before being cured ..	1	
7. Number possible to cure		4,594 or 94.1%
8. Number cured		4,458 " 97.0%

Statistics of John's Hall-Maroon Town Area (*closed districts* 1 – 10, 14 & 15).

1. Census		9,249
a. No. removing before examination ..	3	
b. No. dying before examination ..	1	
c. No. refusing examination ..	3	
2. Number available for examination		9,242 or 99.9%
3. Number examined		9,242 " 99.9%
4. Number found infected		7,213 " 78.0%
a. No. not treated for medical reasons ..	549	
b. No. removing before receiving treatment	59	
c. No. dying before receiving treatment ..	2	
d. No. not located for treatment ..	6	
e. No. refusing to take treatment ..	8	
5. Number available for treatment		6,589 or 91.3%
6. Number treated		6,589 " 100%
a. No. discontinued for medical reasons ..	66	
b. No. removing before being cured ..	64	
c. No. refusing further treatment ..	3	
d. No. discontinuing after 5 or more treatments	151	
7. Number possible to cure		6,305 or 95.6%
8. Number cured		6,249 " 97.5%

Statistics of John's Hall-Maroon Town Area (Districts in progress 11, 12, 13 & 16)

1. Census			2,758
a. No. removing before examination		2	
b. No. dying before examination		1	
c. No. not examined for no reasons		2	
2. Number available for examination			2,753 or 99.8%
3. Number examined			2,753 " 99.8%
4. Number found infected			2,173 " 77.1%
a. No. not treated for medical reasons		194	
b. No. removing before receiving treatment		13	
c. No. dying before receiving treatment		2	
d. No. unclassified		24	
5. Number available for treatment			1,940 or 89.2%
6. Number treated			1,940 " 100%
a. No. discontinued for medical reasons		6	
b. No. removing before being cured		5	
7. Number possible to cure			1,929 " 99.4%
8. Number cured			1,783 " 92.4%

Section IV—Cambridge Area.

Pioneer work has been started in the Cambridge area by Nurse Gabay. Working from the south-eastern section of the area he has reached 823 homes, covering a census of 3,810 people, finding 482 sanitary and 96 insanitary latrines and 101 homes without latrines.

In addition to house-to-house talks and distributions of Health leaflets and posters, he has given 2 lectures at the Pear-Tree-Hill and Catadupa schools to 82, and 104 children respectively.

The Medical Director and Chief Clerk paid two visits to the area to select suitable locations for office and staff residences.

It is hoped to commence treatment operations in the area in January next.

Personnel.

Visitors to the Commission during the year include Dr. B. E. Washburn, head of the Rockefeller Foundation in Jamaica, Dr. J. M. Hall, S.S.M.O., Mr. A. B. Lowe, Vice-Chairman Parochial Board, St. James; Dr. F. E. Lowe, M.O.H.; Dr. E. W. Flahiff of the Tuberculosis Commission, Dr. H. D. Collins, Mr. E. Perkins, M.P.B.; Rev. J. A. Jones, J.P., Mr. H. McGrath, Ex-Collector of St. James; Mr. T. Reid, M.P.B.; and Rev. H. C. Bowen.

Dr. T. B. Sinclair has been in charge of the Unit throughout the year.

Dr. L. M. Watson, former Director who left for one year's study returned and was appointed M.O.H. for Hanover.

Mr. E. S. Edwards, Chief Clerk of Unit No. 1 was transferred to Asst. Clerkship in Unit No. 2 in March. Mr. A. Lindo, Asst. Clerk of Unit No. 2 was transferred here as Chief Clerk.

Mr. E. R. Banks who attended the Sanitary School this year was transferred to the Malaria Commission in October. Mr. R. J. Hyman of the latter Commission was brought here in his stead.

Following the resignation of Miss G. L. Livingstone, Miss S. H. McFarlane acted as typist until 14th May when Mr. R. C. Gray was appointed permanently for the position.

Present Personnel:

Dr. T. B. Sinclair ..	Medical Director.
Mr. A. Lindo ..	Chief Clerk
Mr. O. A. Harris ..	Asst. Clerk
Mr. R. C. Gray ..	Clerk and Typist
Mr. R. S. Heslop ..	Chief Microscopist
Mr. O. L. Levy ..	Asst. Microscopist
Mr. F. J. Fletcher ..	Field Officer
Mr. G. V. Ramsay ..	do.
Mr. G. E. Richards ..	do.
Mr. T. W. Patterson	do.
Mr. C. N. Gentles ..	do.
Mr. N. S. Gabay ..	do.
Mr. H. M. Gray ..	do.
Mr. R. J. Hyman ..	do.

T. B. Sinclair,
Medical Director.

Report of Unit No. 2 of The Jamaica Hookworm Commission for the year 1933.

Introduction.

During the course of the year, full control and financial responsibility for the work of the Jamaica Hookworm Commission was taken over by the Government of Jamaica from the Rockefeller Foundation, who having placed the campaign on a sound basis, gradually withdrew, in accordance with the understanding on which they had undertaken the work.

The Island is greatly indebted to the Rockefeller Foundation and its pioneers, who worked in the Island, for the part they have played in promoting this branch of public health work in Jamaica.

The steady decline, of recent years, in the Island's death rate is admittedly due to the advance in public health work, and the improvements effected in sanitation preparatory to the Hookworm Commission entering an area.

Campaigns have been conducted in 10 of the 14 parishes in the Island to date; only Hanover, Westmoreland, St. Elizabeth and Kingston have not yet been touched by the Commission.

This Unit began operations in Trelawny in January of this year, and having completed work in Upper Trelawny—the Albert Town-Ulster Spring Area—are nearing completion in the Duncans area—the eastern part of Lower Trelawny.

The work of the Commission, as is essential in a campaign against any disease, has been threefold viz., 1. Educational, 2. Prophylactic, 3. Treatment.

Education.

Hookworm disease is no exception to the rule of most diseases, being the result of ignorance or faulty modes of living or habits. Herein lies the most important and, at the same time, the most delicate part of the Unit's work; to educate the people to adopt habits conducive to good health, and to appreciate their responsibility to others in the home and to their neighbours. Fortunately, in Trelawny, Members of the Parochial Board, Ministers, Teachers and other influential individuals of the community have been quick to co-operate and help by the influence of their examples. In consequence, there has sprung up between people and Unit that positive type of relationship which has meant some progress. The desideratum, however, will never be reached until a larger section of the community develop a bigger outlook on life, and a deeper sense of pride in themselves, their children and their community.

Education is not confined to Hookworm Disease, but embraces all infectious diseases including yaws, typhoid, tuberculosis, hygiene, proper food, prevention of malaria are also taught. The educational work consists of house to house talks, pictorial demonstrations, and the distribution of leaflets by the Field Officers at every house in each district taken up. Each house is visited on at least 3 occasions for purposes of such education.

The interest of Teachers, Ministers, Members of the Parochial Board and other influential citizens is sought, and their co-operation solicited. Then by means of school and public lectures, with or without latern slides, and microscopic demonstrations, the education of the people, in matters of health, is also furthered. In addition, the office invites and receives visitors, and gives demonstrations and advice.

During the course of the year, a total of 51 lectures were given to an estimated audience of 13,450.

Prophylaxis.

First in prophylactic measures comes the prevention of the soil, about the homes, and places traversed by barefooted adults and children, from pollution with human excreta. To this end, each area is sanitated with regulation fly-tight pit latrines before the Unit enters. It is pleasing to note the co-operation obtained from most homes, and to see how well their latrines are maintained. The improvement in the health of the inhabitants of each district, so dealt with, testifies to the value of the work. The percentage of homes with proper latrines in districts of Trelawny, where the Unit has worked, is 88.5%. That this figure is no lower, the Unit may claim a little credit for the influence and help it has given. A comparison of the initial and final latrine classification figures will reflect the influence and assistance given by the Unit.

If every home possessed and made use of a proper latrine, hookworm disease would soon cease to be a public health problem.

It is very encouraging, however, to know that the measures being adopted for its prevention are also serving to reduce the incidence, and spread of typhoid, dysentery and other alimentary diseases.

The supervision of the satisfactory maintenance and extension of sanitary latrines devolve on the Medical Officer of Health for the parish.

Treatment.

Following on the steps of Education and Prophylaxis comes the necessity for treating infective individuals, and so remove the personal and communal danger. The increase in health and vigour is so striking in the individuals who have been treated, that the current belief is, that the drugs contain not only anthelmintic, but also tonic properties. The improvement is marked even in those few cases who, after several treatments, are found to be still positive. The explanation is that nearly all worms have been expelled.

Infestation of the people of Trelawny with Ascaris and Trichiuris is fairly high; but these are also got rid of in the course of treatment for hookworms. At times, an individual with a high ascarid infestation, and no hookworm, is given treatment.

A pleasing feature of hookworm treatment is that patients, cured of hookworms, regain their lost vitality and resistance to other diseases. Thus, indirectly, the Commission is fighting and safeguarding individuals from tuberculosis and other diseases. More than that, such all round improvement in the health of the community is bound to result in an increase of earning power, and gradual saving on the item for indigent maintenance.

Operations.—A. The Campaign in the Albert Town- Ulster Spring Area.

January saw the inauguration of work in the Albert Town-Ulster Spring Area of Trelawny.

This area comprises the developed portion of Upper Trelawny, so called on account of its elevation, and not from its geographical position. It is situated in the south-eastern part of the parish, and is bounded on the east by the parish of St. Ann; on the south, by the parish of Manchester; on the north, by lower Trelawny; whilst, on the west lies the Cockpit Country—a rocky, undeveloped and almost uninhabitable portion of Upper Trelawny.

The Area is triangular in outline, with Ulster Spring at the apex, and the base formed by a line joining the village of Highgate Hall in the east to that of Troy in the west. A very rough idea of the topyograph this bit of country may be gathered from the fact that, whilst it covers approximately only 25 square miles on a flat measurement basis, on a land measurement basis there is at least $109\frac{3}{8}$ sq. miles (70,000 acres) its rolling, undulating, wavelike outline presents a succession of hills and glades and inequalities of surface which are most picturesque and beautiful. As a consequence, all routes of travel are of a sinuous outline with steep gradients. There can be seen, on all sides, evidences of peasant industry—cultivated plots—with the small homes of its 12,000 population concentrated in valleys, or more widely separated and distributed on the hills.

The soil is predominantly clay, of the red or yellow variety, modified, here and there, by rocky hillocks an admixture of shale or a thin surface of clayey loam with a clay or marl substratum. The area enjoys a good annual rainfall, and the very fertile nature of the soil is shown up in the cultivations on all sides.

As may be expected, agriculture is practically the only industry, and the population is made up of small settlers for the most part, and a few independent freeholders.

As a result of the unsatisfactory sanitation prior to the improvements undertaken for the Commission to move into the area, the incidence of hookworm infestation was found to be 83.7 per cent. Now, although the climate is one of the most bracing in the Island, and a good admixture of food products is abundant, the majority of the people were anæmic, of a flabby musculature, and of subnormal physical and mental development. The children, too, who comprised about 32.8 per cent of the population, were mostly of stunted growth, and showed large, boggy, toneless protuberant abdomen, and winged scapulae.

That these are the effects of a high and long standing hookworm infestation in the area, is the most reasonable deduction. In fact, there is no other logical cause, for the findings enumerated are those of hookworm disease—confirmed by miscroscopical examinations, which gave the highest average incidence of hookworm infestation obtained in the Island to date.

To their credit, however, was their ready eagerness to undergo treatment, and to co-operate with the efforts of the Commission. Much praise is also due to the teachers and ministers of this area for the able assistance they gave the Unit.

Water Supply.

The water supply of this area is now obtainable from a few "protected" springs and private tanks. There is still room for improvement in order to make the supply a more safe one.

Incidence and Treatment.

In the Albert Town-Ulster Spring Area, from a population of 12,005, 11,996 were examined for hookworms. 9,995 or 83.25 per cent. were found positive. Of these, 9,220 were found physically fit to receive treatment and 9,216 were treated; 693 were not treated for medical reasons.

On post-treatment examinations, a total number of 8,773 cures were obtained. Of the remaining 165, who were not fully cured, 130 belonged to the district of Stettin. The patients in this district proved very refractory to treatment, and the big factor behind this was, undoubtedly, under-nutrition. Poverty, poor housing conditions, lack of ventilation and unlimited crowding, together with previous heavy, long borne infestations, were strikingly evident in this district. Nevertheless, marked improvement in health and physical condition was claimed, and was obvious on inspection even in these 130. It was not found expedient to leave a Nurse in the district when the Unit removed to Duncans, and so arrangements were made with the Medical Officer of Health for the parish for the Sanitary Inspector of the area to continue treatment and follow-up work. The possibilities of reinfestation is unfortunately great in Stettin, because of the poverty of the people and the consequent relatively high percentage of tenanted homes without latrine accommodation. The 35 other cases were distributed throughout 15 districts, and no district had a greater number than 8.

The following were the medical reasons for not treating 693 of the total Albert Town-Ulster Spring population. Gross organic lesions were rare; pregnancy and old age made up the majority.

TABLE I.

Patients not receiving treatment for medical reasons.

Medical Reason.	Number.
Senile Debility	126
Pregnancy	359
Puerperal conditions	36
Vereal Disease	21
Epileptics	2
Yaws	12
Cardiac	11
Paralysis	7
Infirm (Blind, Deaf, Dumb)	7
Asthma	15
Leprosy	2
Cancer	1
Tumours	2
Ulcers	10
Renal	6
Fever	3
Bronchitis (acute)	1
Rheumatism	23
Insanity	4
Stricture	1
Dysentery	1
Hernia	2
Unclassified	39
Appendicitis	2
Total	693

Patients who were discontinued for medical reasons.

Medical Reason.	Number
Debility	5
Pregnancy	13
Venereal Disease	8
Epileptic	1
Yaws	1
Renal	2
Bronchitis	2
Intestinal Troubles	1
Death	2
Unclassified	6
Total	39

Total stool examinations done in the Laboratory amounted to 27,150 including 11,964 first examinations, 14,059 re-examinations, and 1,127 private examinations. 27,043 treatments were administered including 9,216 first treatments. In addition, a total of 832 private treatments were given, and 224 cured.

Detailed figures for the area are as follows:—

TABLE II.

No.	District.	Census.	Examined.	Infected.	Treated.	Cured.	Under Treatment.
1	Albert Town	701	701	580	518	486	5
2	Stettin	961	961	828	774	627	131
3	Freeman's Hall	734	734	636	615	590	1
4	Wire Fence	420	420	348	323	319	..
5	Ulster Sprng	798	798	633	557	546	2
6	St. Vincent	563	563	470	433	401	..
7	Rock Spring	554	553	474	439	414	..
8	Dutch Hill	540	537	439	411	367	6
9	Wait-a bit	885	885	753	703	696	..
10	Wilson Valley	1,210	1,210	1,069	1,000	987	1
11	Lowe River	682	682	534	496	484	..
12	Lorrimers	715	714	570	516	482	8
13	Warsop	931	931	769	696	691	3
14	Troy ..	781	777	648	581	567	2
15	Lichfield	722	722	598	558	532	1
16	Wilson Run	808	808	646	596	584	5
	Totals	12,005	11,996	9,995	9,216	8,773	165

The Latrine Classification for the area follows:—

No.	Dstrict.	Homes.	First Classification. D.	E.	F.	Last Classification. D.	E	F.
1	Albert Town	141	128	9	4	135	3	3
2	Stettin ..	165	143	1	21	146	1	18
3	Freeman's Hall	145	136	..	9	145	..	..
4	Wire Fence	79	66	..	13	68	..	11
5	Ulster Spring	149	131	1	17	144	..	5
6	St. Vincent	116	91	1	24	94	3	19
7	Rock Spring	108	101	2	5	102	1	5
8	Dutch Hill	105	95	2	8	96	1	8
9	Wait-a-Bit	147	129	1	17	132	..	15
10	Wilson Valley	240	176	4	60	192	2	46
11	Lowe River	122	97	22	3	118	1	3
12	Lorrimers	132	107	4	21	107	4	21
13	Warsop	185	173	2	10	184	..	1
14	Troy ..	167	125	5	37	125	4	38
15	Lichfield	142	128	3	11	130	2	10
16	Wilson Run	139	109	6	24	114	..	25
	Totals	2,282	1,935	63	284	2,032	22	228

Incidence of other Diseases.—The infestation with Ascaris and other intestinal parasites in the area was high.

The incidence of other diseases such as yaws, malaria, typhoid and tuberculosis is happily low, although most of the cases of typhoid reported in Trelawny occurred in this area. This fact seems to point to the need of ensuring a more safe water supply.

Albert Town-Ulster Spring Area.

Statistics of Districts 1 – 16.

1. Census			1,2005
a. No. of people removing before examination	8		
b. No. of people dying before examination	1		
2. Corrected Census			11,996 or 99.9%
3. Number of people examined			11,996 or 100%
4. Number of people found infected ..			9,995 or 83.25%
a. No. of people not reated for medical reasons	693		
b. No. removing before receiving treatment	80		
c. No. refusing to take treatment ..	1		
d. No. dying before receiving treatment ..	1		
5. Number of people available for treatment ..			9,220 or 92.2%
6. Number of people treated			9,216 or 99.9%
No. receiving 1 treatment	9,216		
No. receiving 2 treatments	9,175		
No. receiving 3 treatments	3,594		
No. receiving 4 treatments	3,566		
No. receiving 5 treatments	1,185		
No. receiving 6 treatments	260		
No. receiving subsequent treatments ..	47		
a. No. discontinued for medical reasons ..	39		
b. No. removing before being cured ..	51		
c. No. refusing further treatment ..	3		
d. No. dying before being cured ..	2		
e. No. not located for further treatment ..	1		
f. No. discontinued after 5 treatments ..	182		
7. Number of people possible to cure ..			8,938 or 96.9%
8. Number of people cured			8,773 or 98.1%

Percentages cured after Re-Examination.

Re-Examination.	Maximum.	Minimum.	Average.
1st	76.1%	52.0%	60.2%
2nd	78.7%	46.9%	65.5%
3rd	90.9%	20.4%	61.6%
4th	100%	25.0%	54.8%

B.—The Campaign in the Duncans Area.

The offices of the Unit were transferred to Duncans on 31st July, 1933, pioneer work by 4 nurses having been completed.

The Duncans Area embraces approximately 70 square miles of country. It is limited on the north by the sea, south by a horizontal line drawn through the parish at the level of Mahoe Hill, situated 1 mile north of Ulster Spring. Eastward, it abuts on the parish of St. Ann; westward, it is bounded by a perpendicular line drawn through the parish passing through Duanvale Village.

The southern portion of the area presents much the same topographical appearance as does Upper Trelawny, a series of shapely rising hills being intercepted by deep narrow valleys. Here, however, the hills are of more rocky formation, a comparatively thin layer of clay-loam coating the limestone. A plain of varying width separates the hills in the south from the sea. In the western portion of the area, this plain is approximately 12 miles wide, while to the east, at Rio Bueno, the hills approach to within a mile of the sea coast.

In the hill country to the south, the chief means of livelihood of the people, as was the case of Upper Trelawny, is cultivation of bananas, yams, cocoa, etc., on small, owned or rented lots. These relatively independent tillers of the soil seem more happy, are better placed financially, and more readily realise and live up to the responsibilities of citizenship than do the labourers in the northern plain.

The comparatively flat strip of country next the sea is, for the most part, occupied by large estates on which sugar cane, and, to a lesser degree, bananas, cocoanuts and Indian corn are grown. The flat nature of the country, and an excellent rainfall, make for provision of ideal grazing lands; hence cattle rearing and dairy farming bulk largely in estate pursuits.

The area is well supplied with roads. The main roads are, for the most part, of fairly good surface.

The inhabitants of Lower Trelawny live in relatively widely scattered areas, as compared with those in Upper Trelawny. This is due to the large tracts of land occupied by cane fields and farms.

The four main townships of the area are Duncans, Clark's Town, Stewart Town and Jackson Town. These have an aggregate population of 3,485, and are the marketing and business centres of eastern Lower Trelawny.

Water Supply.—The area possesses a very satisfactory water supply which, with the exception of Stewart Town and Sawyers, come under the Dornoch Scheme. Before this scheme was in operation, there used to be a yearly outbreak of diarrhoea and vomiting, with many deaths resulting. The cause was attributed to the Ackee. Since the inauguration of the Dornoch Scheme, these outbreaks have ceased entirely, and patients reported with diarrhoea and vomiting have been extremely scarce. In addition, there have been comparatively few cases of typhoid in this area as compared with Upper Trelawny, which has a less satisfactory supply.

Stewart Town has recently had built a tank of a capacity of 800 gallons; the supply to this tank is obtained from a tributary of the Dornoch River, and is delivered to the town from standpipes. This has been a great boon to those of the inhabitants without private tanks.

In Sawyers, also, 2 public tanks have recently been built and afford a satisfactory supply for the inhabitants of the district.

Sanitation: The sanitation in the Duncans Area has been brought to a fairly high standard (82%), with the exception of the Rio Bueno-Calabar district, which is only 41.9% sanitated. Here there is only a thin layer of loam on underlying rock which, without the use of dynamite, has obstructed the erection of pits. In consequence, sanitation has been held up in this section, as well as the work of the Unit; for, before permanent and effective value can be obtained from treatment work, sanitation must be of a very high standard.

The Unit began its census and educational work in this district on November 12. Already the Field Officer has been able to have 14 new latrines erected, and many more are under construction. If this co-operation and rate of progress is maintained, and if the supervision of blasting operations, where necessary, is forthcoming, January should see the continuance of the work in all its phases in the district.

Incidence and Treatment: The Unit is nearing completion of its work in this area. Of the 13 districts into which the area is divided, 8 districts are now satisfactorily completed; one course of treatment and re-examinations has been conducted in another; and four remain to be physically examined and treated.

The practically unprecedented rains of the latter half of the year considerably lessened the possible attendances at lectures, and washed out most of those scheduled for Health Week. The routine work of the Unit, however, was not materially affected.

From a total population of 10,489, in the 13 districts, 10,457 have been examined for hookworms, and 6,241 or 59.6% found positive. Of these, 4,390, from 9 districts were found physically fit to receive treatment, and 4,317 were treated; 357 were not treated for medical reasons. The total cures to date are 4,011, 57 have discontinued treatment for various reasons, and 249 are still under treatment. In addition, 96 private treatments were given and 23 cures obtained.

The medical reasons for which 357, in 8 districts, have not received treatments are as hereunder. If these follow the instructions, which have been particularly stressed in their cases, against spreading the disease by improper hygiene and insanitary habits, they will not be a source of danger to the community.

TABLE I.

Patients not receiving treatment for medical reasons.

Medical Reason.	Number.
Senile Debility	132
Pregnancy	128
Puerperal	11
Venereal Disease	7
Yaws	15
Cardiac	10
Paralysis	4
Infirm	2
Asthma	6
Leprosy	1
Ulcers	2
Renal	2
Fever	1
Rheumatism	13
Insanity	2
Tuberculosis	2
Appendicitis	1
Unclassified	15
Dead	3
Total	357

DUNCANS AREA.

Statistics of Districts 1 – 8 (closed).

1. Census			6,796
a. No. of people removing before examination	4		
b. No. of people refusing examination	8		
2. Corrected Census			6,784 or 99.82%
3. Number of people examined			6,780 or 99.92%
4. Number of people found infected			4,179 or 61.63%
a. No. of people not treated for medical reasons	357		
b. No. removing before receiving treatment	22		
c. No. dying before receiving treatment	2		
5. Number of people available for treatment			3,798 or 90.8%
6. Number of people treated			3,792 or 99.57%
No. receiving 1 treatment	3,792		
No. receiving 2 treatments	3,780		
No. receiving 3 treatments	926		
No. receiving 4 treatments	919		
No. receiving 5 treatments	190		
No. receiving 6 treatments	29		
No. receiving 7 treatments	1		
a. No. discontinued for medical reasons	20		
b. No. removing before being cured	13		
c. No. discontinued after 5 treatments	24		
7. Number of people possible to cure			3,735 or 98.5%
8. Number of people cured			3,715 or 99.46%

Percentages cured after Re-examination.

Re-examination.	Maximum.	Minimum.	Average.
1st	83.4%	67.9%	75%
2nd	84.1%	75.0%	78.15%
3rd	87.0%	60.0%	75.27%
4th	100%	87.5%	84.0%

Patients who were discontinued for medical reasons.

Medical Reason.	Number.
Pregnancy	12
Menstrual Disorder	1
Yaws	1
Malaria	2
Fever	1
Unclassified	3
Total	20

Total stool examinations done in the laboratory amounted to 16,300 including 10,460 first examinations 5,400 re-examinations, and 440 private examinations. In all, 10,668 treatments have been administered including 4,317 first treatments.

Detailed figures for the area are as follows:—

TABLE II.

No.	District.	Census.	Examined.	Infected.	Treated.	Cured.	Under Treatment.
1.	Jackson Town ..	855	855	647	595	587	1
2.	Duanvale ..	1,373	1,370	955	870	854	..
3.	Spicey Hill ..	773	773	378	346	341	4
4.	Sawyers ..	659	659	458	408	395	3
5.	Crawle ..	1,077	1,071	518	465	460	2
6.	Stewart Town ..	1,005	1,002	634	564	559	..
7.	The Alps ..	589	588	425	394	375	6
8.	Refuge ..	465	461	164	150	144	4
9.	Kinloss ..	721	718	592	524	295	229
10.	Clark's Town ..	717	716	471	1	1	..
11.	Rio Bueno ..	663	662	245	..	..	..
12.	Duncans ..	908	902	310	..	..	..
13.	Old Mountains ..	684	680	444	..	..	..
	Totals ..	10,489	10,457	6,241	4,317	4,011	249

The Latrine Classification for the Area follows:—

No.	District.	Homes.	First Classification. D.	E.	F.	Last Classification. D.	E.	F.	
1	Jackson Town ..	185	177	3	5	179	2	4	
2	Duanvale	269	187	11	43	225	6	10	
3	Spicey Hill	168	128	4	29	143	3	15	
4	Sawyers ..	117	84	4	28	98	4	14	
5	Crawle ..	235	187	12	23	201	3	18	W.C. 5
6	Stewart Town	209	196	1	8	204	..	1	
7	The Alps	106	79	..	13	79	1	12	
8	Refuge	107	88	2	17	93	6	8	
9	Kinloss	169	148	1	19	..	..	..	
10	Clark's Town	212	118	15	4	..	..	..	
11	Rio Bueno	185	63	18	70	..	..	..	
12	Duncans	211	168	10	18	..	..	..	
13	Old Mountains	155	116	1	10	..	..	..	
		2,328	1,739	82	287	..	..	..	

Incidence of Other Diseases: The infestation with Ascaris and other intestinal parasites, as in Upper Trelawny, is fairly high.

Yaws is quite prevalent in the southern portion of the Duncans area, particularly in the more wet districts of Duanvale, Kinloss, Clark's Town, Stewart Town and the Alps.

Malaria is also fairly common in Duanvale. Other districts have sporadic cases from time to time The incidence of other infectious diseases, such as Tuberculosis and Typhoid is low.

C.—THE CAMPAIGN IN THE FALMOUTH AREA.

Pioneer work was started in this area on December 1, when one Field Officer was minuted for this work. He is stationed, pro tem. in an outlying district of the area, viz., Deeside, which is 12 miles from Falmouth. To date, 297 homes have been visited covering 1,329 inhabitants, and 7 group lectures given to attendances totalling 550; in addition, the distribution of literature and educational work from house to house is being carried out.

Two other Field Officers will be available for pioneering work in the area in January of the new year.

ORGANIZATION.

Offices: The main office was situated at Albert Town for the first seven months of the year, and at Duncans for the last five months. Sub-offices, under the charge of Nurses Oliver and East, were kept at Warsop, Lowe River and Jackson Town.

Personnel: Dr. L. E. Arnold was appointed to the Jamaica Yaws Commission and was succeeded by Dr. A. A. Peat on 12th April, 1933.

Dr. A. A. Peat was transferred to the Yaws Commission on 4th September, 1933, and Dr. L. M. Watson appointed to the vacancy for the remainder of the month.

Dr. L. M. Watson was promoted Medical Officer of Health for the parish of Hanover, and Dr. H. D. Chambers was appointed Medical Director as from 1st October, 1933.

Mr. F. Gordon Somers, Chief Clerk, was granted leave to attend the School for Sanitary Inspectors, and completed a successful course of studies in March.

Mr. A. J. Harding, Field Officer, left the Unit on 7th July, and Mr. A. N. Hamilton was appointed in his place on the 24th of the month.

Mr. A. Lindo, Assistant Clerk of the Unit, was transferred to Unit No. 1 as Chief Clerk, and Mr. E. S. Edwards of that Unit was appointed in his stead.

There has been whole-hearted co-operation between office staff and field officers. The latter, in addition to their work of census, treatment, and giving assistance with sanitation, must do house-to-house educational work, and record any cases of infectious diseases in their districts. Moreover, the Unit has undertaken to make a census of yaws in their routine census work, and to be responsible for giving all the assistance necessary in the Anti-Yaws Campaign, whilst, and so long as, the Unit is working in any district.

With these objects in view, lectures have been given the field officers on tuberculosis, typhoid, yaws, hygiene, proper food.

The present personnel is as follows:—

Medical Director	..	Dr. H. D. Chambers
Chief Clerk	..	Mr. F. Gordon Somers
Assistant Clerk	..	Mr. E. S. Edwards
Typist and Clerk	..	Mr. R. J. Moody
Chief Microscopist	..	Mr. O. L. Atterbury
Asst. Microscopist	..	Mr. S. G. Allen
Field Officers	..	Messrs. P. M. East, C. J. Hales, R. S. Oliver, S. A. Dougherty, V. A. McKenzie, P. A. Hyde, H. W. Jones, A. N. Hamilton
Caretaker	..	Irene Johnson.

A visit was paid to the office by Major T. J. Hallinan, Superintending Medical Officer.

Frequent visits were also paid by Dr. J. M. Hall, Senior Sanitary Medical Officer, Dr. B. E. Washburn, Director of the Bureau of Health Education and Health Activities of the International Health Board of the Rockefeller Foundation in Jamaica; Dr. W. J. Branday, Medical Officer of Health for Trelawny; Rev. J. W. Maxwell, Chairman of the Parochial Board of Trelawny; Dr. A. J. Arthurs, District Medical Officer, Duncans; Dr. F. Russell, Director of the Rockefeller Foundation; Dr. E. L. Opie, Dr. Dochez, Dr. H. H. Howard, Dr. Molloy; Drs. T. B. Turner and G. M. Saunders, Directors of Yaws Commission in Jamaica; and Mr. Magoon, Water Engineer of the Rockefeller Foundation; also Dr. E. O. Jordan, one of the scientific directors of the International Health Division of the Rockefeller Foundation; Hon. G. S. Ewen, Dr. Solon Nunez, Minister of Health of Costa Rica; and Dr. D. Escalante, General Director of Health in Salvador, honoured us with their visits.

The Unit has the pleasure of visits from Dr. C. Franco of the Uncinariasis Commission of Colombia, and Dr. E. Gonzales of the Rockefeller Foundation in Chitre, Provincia de Herrara, Republica de Panama; both of whom remained with the Unit for some time.

Other visitors included Rev. H. S. Lynch, M.P.B.; Rev. R. Evelyn, Revds. R. A. L. Knight, H. D. Dickens, M. Burgess, Morgan, Dr. Foster, Drs. T. B. Sinclair, S. Ferreira, H. D. Collins.

Summary.—From the commencement of the work in the parish of Trelawny in 1933, 29 districts have been opened. 24 of these have been closed, and the remaining 5 are being worked.

The total census for the year is 22,494; 22,453 have been examined, and 16,235 found infected; the average degree of infection being 72.4%. 13,533 have been treated and 12,784 cured.

Soundings were carried on at 26 centres where 11,434 persons were physically examined.

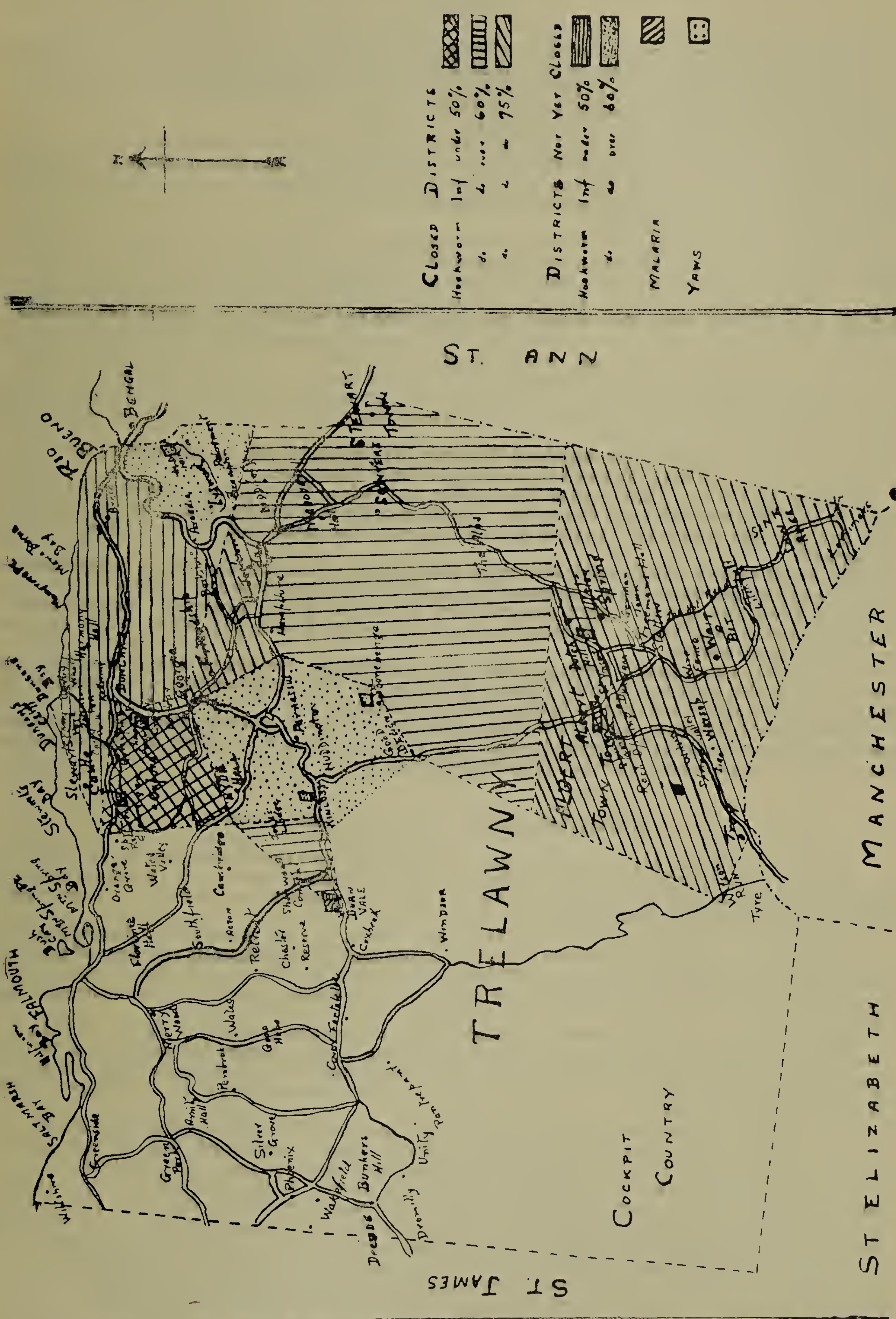
The average number of treatments per cure was 2.9; and, based on drug and capsule cost, the per capita cost per treatment was 1d, and per cure 3d.

51 public lectures have been given to approximately 13,450 people. In addition, the health education of the people has been furthered by means of group talks from field officers, leaflets, charts, lectures, demonstration of specimens and microscopic demonstrations.

The office remains at Duncans for the commencement of 1934.

H. D. Chambers,
Medical Director.

Map showing Incidence of Hookworm and other diseases and Sphere of the Unit's work in the parish of Trelawny.



XI.—*Report of the Malaria Commission for* 1933.

1. General.

There was marked improvement in all areas during the first half of the year, which was not maintained during the second half, owing to the unusual rainfall from June to December.

The total rainfall from January to May 1933 was 14.84 inches, while that in June alone was 13.76 inches. From June to October the precipitation was 80.03 inches. The year ended with a rainfall of 116.53 inches, the Island's mean for 60 years being 73.64 inches.

In 1931 there was a rainfall of 91.53 inches. This was followed by an epidemic of malignant malaria over the whole of the western half of the Island. Fever in epidemic proportions has only affected two parishes, St. Elizabeth and Westmoreland, and to a less degree in St. Andrew, Kingston and St. James. The death rate and disability are less in St. Elizabeth and Westmoreland as compared with the epidemic of 1931, but the tendency to relapse is more marked.

The epidemic of 1931 was aestivo autumnal in type, that in 1933 purely autumnal. St. Elizabeth escaped the 1931 epidemic. Examinations in the outside zones Parottee, Pondside, showed less fever than in 1930. Owing to previous years of drought, and fewness of adult mosquitoes, breeding was not abundant in 1931. The generous rainfall of 1932 supported increased breeding of anophelines and fever appeared at Santa Cruz, Lacovia, Slipe, New Holland, Star Apple Tree and increased at Pondside, and Parottee.

The heavy precipitation of 1933 further improved conditions favourable for increased anopheline breeding and the increased fever cases of 1932 supplied parasites for the widespread infestations.

The areas under control showed increased larval and adult breeding. All permanent water collections were increased in extent and temporary water collections appeared and many remained during the whole period. The hours of work were curtailed, films of Paris green were often destroyed by the showers and current before they became effective.

Oil supplied by the Parochial Boards of Trelawny, Westmoreland and St. Elizabeth by the United Fruit Coy. and Jamaica Sugar Estates Ltd., was used to assist Paris green.

Ditching especially at Little London, Sav.-la-Mar, and Golden Grove proved serviceable and will in future be used where conditions are favourable. Judged from the results of the Annual Survey and weekly fever incidence, the control work was less seriously affected than anticipated, by the adverse conditions encountered.

The area of Annotto Bay showed improvement over last year. Falmouth also showed marked improvement. Oracabessa and Jacks River, Caymanas, Vere and Little London showed no reverses.

Black River, Sav.-la-Mar showed increased fever in November and December. Golden Grove in August, September and October. Montego Bay showed increased fever in June lessening and increasing by turns up to December.

In June 1931 the malignant Tertian parasite was predominant. Increase of fever in the areas under control showed this parasite. In 1933 increased fever cases in areas under control, were chiefly of the Benign Tertian variety—especially at Golden Grove and Montego Bay.

The Health Units in the parishes have taken an interest in the work and have given valued assistance, and some are contemplating independent work. The property owners in the areas of endemic malaria have also shown an increased interest and a disposition to assist.

2. Detailed Reports of Areas under Control.

Caymanas.—This area now extends from the Ferry River to the Citrus Grove near the 10th mile, and from the bank of the Rio Cobre to the foot of the hills in the Caymanas Estate. The management has for the past two years selected the staff and paid all expenses in connection with the work. There were 93 days of rain with a fall of 77.05 inches.

A portion of the area could not be worked for a few months, as it was inaccessible. Anopheline larval and adult production increased from June to November, but control was sufficiently effective and prevented any outbreak of fever. Blood smears from 128 labourers showed a parasite index of 3.9% as against 2.85% the preceding year and 13.46% in 1931. The spleen rate was 5.4% and were all found amongst East Indians

The shifting habit of the labourers continued though less than in past years. 62 new arrivals, were noted between June and December and 16.3% of them showed smears positive for malaria on arrival. 80 complained of fever during the year, 22 of them were positive malaria. An attempt was made to treat all with positive blood for 3 consecutive weeks. 32 were so treated, (with quinine) and blood smears examined after each week's treatment.

Annotto Bay.—Efficient control was maintained in this area. There was marked improvement over last year. There were 99 days of rain with a fall of 109.45 inches. Larval and adult breeding increased in the second half of the year, but few blood smears showed parasites in the peripheral blood.

A total of 156 smears sent up for the year showed 26 positives. At the Annual Re-survey in October, 139 children were examine l with a parasite index of 5.7% as against 16% in 1932. The spleen rate was 19.4% as against 10% in 1932. The average of adults of A. albimanus was low during the year while that of A. vestitipennis was high. The difficulty of obtaining a satisfactory diluent for Parish green still obtains.

Oracabessa and Jacks River—Control in this area is maintained at a low cost but proves effective. One sanitary inspector and one labourer is employed. 135 days of rain were noted with a fall of 120.87 inches. 100 children examined at Oracabessa showed a parasite index of 2% and spleen rate of 10%. The same number at Jacks River showed a parasite rate of 6% and spleen rate of 14%. Larval breeding of A. grabhami continued to be more abundant than A. albimanus. Two blood smears were received during the year from fever cases observed and one was positive.

Montego Bay..—100 children examined in September of this year showed a parasite rate of 3% as against 2.5% last year. No fever cases were reported up to the end of May, but sporadic cases began in June and continued throughout the year. 90 smears were sent up during this period and 26 were positive malaria as against 11 with one positive the previous year.

The larvae and adults of A. albimanus exceeded those of A. grabhami, the reverse of the preceding years. There was marked increase of fever in the parish and especial treatment had to be resorted to. 41 children examined at the Bickersteth School 12 miles from Montego Bay showed a parasite rate of 26.8%. 74.33 inches of rain fell during the year.

Vere.—A programme of increased cane cultivation in this area was decided on. The success of the venture depended on the health of the large increase of labourers needed. Arrangements were made for efficient medical treatment at the Vere Dispensary. 220 blood smears were taken from labourers in April and showed a parasite rate of 6%, this is the lowest parasite rate recorded in this area and was very encouraging. 156 blood smears were sent up during the year of which 60 showed parasites as against 338 with 116 positives in 1932 when the population was less. The last fortnight of November showed a slight increase of fever which quickly lessened.

In September 70 children from the Vere School and 94 labourers showed a combined parasite index of 23.4%. This high parasite rate was unexpected from the low weekly fever incidence during the year. The fever producing limit of parasitisation was evidently not often reached.

There were 63 days of rain and 100.38 inches fell.

Golden Grove.—The weekly fever incidence progressed along normal lines until August when a sharp rise of Benign Tertian fever appeared at Stokes Hall and Duckenfield. It lessened in September and became normal in October.

182 smears with 45 positive were received during the year as against 213 with 68 positive in 1932. The Annual Resurvey in September showed a parasite index of 12% as against 9% the previous year. The spleen rate was however 45%. With the aid of the Jamaica Sugar Estate Ltd., the area was extended especially towards the north. Extensive ditching is being done. Fever cases are treated by a private physician once a week also at the Hordley Hospital. The admissions to the hospital were less in proportion from the control area, and has been less from all areas for the past three years. There were 166 rainy days with a fall of 112.43 inches for the year.

Black River.—Examinations of 100 children in this area showed a parasite index of 6% and spleen rate of 14% as against a parasite index of 8% and a spleen rate of 5% in 1932. The examination was done in September. As a result of the heavy precipitation during the latter half of the year, existing water collections increased in size and many new ones were formed with supported dense anopheline breeding. Collections of adult mosquitoes showed an increase of A. albimanus. During the epidemic of malaria in the plains of St. Elizabeth the area showed an increased fever incidence during November and December. An increase of labour staff was found necessary. The Parochial Board supplied oil to assist in control.

Extensive trimming of the mangrove on the river banks was undertaken early in the year which materially lessened the accumulation of hyacinth vegetation and debris. The breeding on the river was reduced to a minimum. 77 inches of rain fell for the year distributed over 127 days.

Falmouth.—There are two main swamps behind the town. The Martha Brae between the road and river bearing this name, is fully exposed to sunlight, supports A. albimanus breeding and is only partly accessible. The Broderick on the other side of the Martha Brae road, is densely shaded with mangrove and supports A. grabhami breeding. From March to June the Martha Brae swamp became dry—A. albimanus practically disappeared from the area and with them all fever incidence.

In July the Martha Brae river overflowed its banks and the swamp was refilled. A. albimanus reappeared in large numbers. All rain water collections in the town showed larvae of A. albimanus and were sprayed with oil supplied by the Parochial Board. Fever incidence increased in August, September and October, lessening in November and December.

The fever incidence of 1932 was less than expected being the year after the epidemic but the parasite rate at the Annual Survey was 20%. 100 children examined in September this year showed the parasite rate at 3% and spleen rate at 3%. This result was unexpected. There were 81 rainy days with a fall of 60.32 inches.

Sav.-la-Mar.—Control work in this area began in July 1932. Anopheline flight was dense in the town and many fever cases were noted. The swamp at the southern extremity of the town was brackish and no anopheline breeding was found. The adult catch was low. The response to control appeared excellent but a survey in September (1933) showed a higher parasitisation than was expected. Fever cases appeared in the poorer section of the town and where the anopheline flight was least. The swamps had been freshened by the heavy rains and were found breeding.

Unlocated water collections were found in the vicinity of the hospital which were supporting dense breeding, and many anophelines were found in a female ward in which a screendoor had been wrenched off during the storm of November and had not yet been replaced.

The dense anopheline flight in the town was rapidly reduced by ditching of the Dunbar River at the eastern limit of town. There were 138 rainy days with a fall of 87.98 inches.

Little London.—The control work in this area began in August, 1932. The problem consisted of about 63 ponds of varying extent. Paris Green was the anti-larval measure used during the first month. Subsequently about 40 of these ponds were connected by ditches and drained by a main channel to the sea. The lands thus recovered were cultivated and yielded excellent crops of vegetables. Parts are now growing cane. During the heavy rains many of these drains were fouled with silt and debris and anopheline breeding increased, but did not cause serious fever. The parasite index at the Annual Survey was low. Property owners in the neighbourhood have expressed their willingness to bear part of the cost of extension of the work. The rainfall was 105.10 inches for the year.

3. Statistical Tables.

Tables are attached which give details of the numbers of larvae and adult moquitoes caught in each area, also the results of weekly examinations of fever in each area, and results of blood and spleen examination at the Annual Resurveys.

TABLE 1.—Larvae collected from each area during 1933.

Areas.	Larval catches.		Variety.			
	Total.	Large.	A. albimanus.	A. vestitipennis.	A. grabhami.	A. crucian.
Caymanas ..	2,528	697	2,459	..	59	
Annotto Bay ..	6,426	1,717	4,807	197	1,422	
Oracabessa ..	917	308	199	..	718	..
Montego Bay ..	953	105	551	..	402	..
Vere	1,108	225	1,044	..	64	
Golden Grove ..	1,018	261	1,496	4	163	
Black River ..	1,478	373	1,406	2	66	4
Falmouth ..	1,141	95	732	5	404	..
Sav.-la-Mar ..	1,358	251	1,220	63	75	..
Little London ..	2,305	563	2,224	53	28	

TABLE 2.—Collection of Adult Mosquitoes from each Area during 1933.

Areas.	Adult Catches.		Variety caught.			
	No. of Catches.	No. caught.	A. albimanus.	A. vestitipennis.	A. grabhami.	A. crucian.
Caymanas ..	104	441	421	13	7	
Annotto Bay ..	107	648	279	350	19	..
Oracabessa ..	66	14	5	..	9	..
Montego Bay ..	110	308	175	17	116	
Vere	94	154	142	2	10	
Golden Grove ..	123	904	589	180	135	
Black River ..	94	1,307	240	25	32	1,010
Falmouth ..	148	921	481	130	310	
Sav.-la-Mar ..	94	1,043	752	172	30	89
Little London ..	110	717	498	209	10	..

TABLE 3.—Results of Blood Examinations for all areas during 1933.

Areas.	Weekly Fever Incidence.					
	No. smears taken.	No. Positive.	Parasite found.			
			P. Vivax.	P. Falciparum.	F. Malariæ.	Mixed.
Caymanas ..	80	22	11	11		
Annotto Bay ..	156	26	12	14		
Oracabessa ..	2	1	..	1	..	..
Montego Bay ..	90	26	14	10	1	1
Vere	156	60	27	28	5	
Golden Grove ..	182	45	29	16		
Black River ..	54	14	2	10		
Falmouth ..	77	28	10	18		
Sav.-la-Mar ..	91	28	9	19	..	..
Little London ..	72	2	8	15	2	

TABLE 4.—Results of Blood Examinations for all areas at Annual Survey—1933.

Areas.	Annual Re-survey.						
	No. Examined.	No. Positive.	Per cent. Negative.	Parasite found.			
				P. Vivax.	P. Falciparum.	P Malariae.	Mixed.
Caymanas ..	128	5	3.9	4	..	1	..
Annotto Bay ..	139	8	5.7	5	2	1	..
Jacks River ..	100	6	6	2	2	2	..
Oracabessa ..	100	2	2	..	1	1	..
MontegoBay ..	100	3	3	..	2	1	..
Vere ..	164	38	23.4	23	13	2	..
Golden Grove ..	100	12	12	11	1	..	..
Black River ..	100	6	6	2	3	1	..
Falmouth ..	100	3	3	1	2	..	..
Sav.-la-Mar ..	150	15	10	10	4	1	..
Little London ..	100	2	2	2	..	..	..

TABLE 5.—Results of Examination for Enlarged Spleens Annual Re-Survey, 1933.

Areas.	No. Examined.	No. Enlarged.	Per cent. Enlarged.	Palpable.	Spleen size encountered.			
					1.	2.	3.	4.
Caymanas ..	128	7	5.4	..	1	1	1	4
Annotto Bay ..	139	27	19.4	13	8	4	2	..
Jacks River ..	100	14	14	10	2	2	..	
Oracabessa ..	100	10	10	7	3	..	..	..
Montego Bay ..	100	9	9	7	1	1	..	..
Vere	70	21	30	14	..	5	2	..
Golden Grove ..	100	45	45	32	9	3	..	1
Black River ..	100	14	14	10	2	2	..	..
Falmouth ..	100	3	3	..	2	1	..	..
Sav.-la-Mar ..	150	16	10.6	14	..	2	..	..
Little London ..	100	19	19	13	1	4	..	1

XII.—THE TRAINING OF HEALTH WORKERS.

Aside from the training of sanitary inspectors as already reported, Government has been aided by the Rockefeller Foundation in training medical and other officers in public health work. Fellowships which provide study and practical field experience are assigned to the Island Medical Department and the Superintending Medical Officer selects officers for their special training. In November, 1933, Dr. L. M. Watson who had formerly been in charge of a treatment unit of the Hookworm Commission completed a year at the School of Hygiene and Public Health of Harvard University and returned and took up work as whole-time Medical Officer of Health of Hanover Parish. Dr. H. M. Johnston, Medical Officer of a treatment unit of the Yaws Commission, left in September for study at Harvard.

The twelve health workers who have received special training through assistance from the Foundation all hold important posts, as follows:—

Name.	Date of Study Leave.	Present Position.
Dr. I. J. Cruchley ..	1927-8	Medical Officer of Health, Kingston
Miss G. Edwards ..	1928	Technician, Malaria Commission
Dr. J. M. Hall ..	1928-9	Senior Sanitary Medical Officer of the Colony
Dr. F. W. Aris ..	1929	Medical Officer of Malaria Commission.
Dr. G. S. Escoffery ..	1929-30	Medical Officer of Health, St. Catherine
Dr. E. J. Isaacs ..	1930	Medical Officer in Charge of Tuberculosis Dispensary
Dr. F. H. N. Cruchley ..	1930-31	Medical Officer of Health, Portland
Dr. K. L. Evans ..	1930-32	Government Bacteriologist
Dr. W. J. Branday ..	1931-32	Medical Officer of Health, Trelawny.
Mr. W. Kirkpatrick ..	1931-32	Engineer, Water Department
Mr. H. Vendryes ..	1932	In charge of Chlorination, Water Department, Kingston and St. Andrew Corporation
Dr. L. M. Watson ..	1932-33	Medical Officer of Health, Hanover.

XIII.—VISITORS.

During 1933 a number of prominent health officials from other countries visited the Jamaica Co-operative Work. Among these were Professor E. O. Jordan and Dr. A. R. Dochez, of the Board of Scientific Directors, and Dr. F. F. Russell, Director General; and Dr. H. H. Howard, Associate Director of the International Health Division of the Rockefeller Foundation; Dr. E. L. Opie of Cornell University, who directs the work of the Jamaica Tuberculosis Commission; Drs. G. C. Payne and D. M. Mollov who have charge of the Foundation's work in Puerto Rico and Central America; and Dr. Solon Nunez, Minister of Health of Costa Rica, and Dr. David Escalente, Commissioner of Health of El Salvador. In addition to these the following public health officers came to Jamaica to study the methods in use in the Co-operative Units; Dr. Amadeo Vicente Mastellari, Director of Tuberculosis Control, Republic of Panama; Dr. A. Pena, Director of Tuberculosis Work, Costa Rica; Dr. C. Franco F., Director of Sanitation of Colombia; Dr. J. Rodriguez Paster, Director of Bureau of Tuberculosis, Porto Rico; and Dr. E. Gonzales, A., Departmental Health Officer, Republic of Panama.

XIV.—Co-operation.

The review of public health work in Jamaica, as given in this report, shows that the people have co-operated, otherwise permanent health departments supported by local taxation could not have been established. Such desirable results are due to the support given by parochial leaders, especially estate owners and managers and the small settlers who followed their example and provided sanitation and home improvements; also medical men, members of Parochial Boards, teachers and ministers. And there has always been the fullest support from the Central Board of Health and the Government Medical Department as well as from other Government Departments. Due to this intelligent support propaganda for public health has spread to all parts of the Island until at present sanitation and disease prevention are recognized as important items of public concern and provision for their maintenance forms an important part of the budgets of every parish as well as of the Central Government.

Special mention should be made of the help given to the Hookworm Commission in its early work by the Jamaica Imperial Association which, through a special committee, called to the attention of the planters the importance of controlling the soil pollution diseases. Another invaluable aid has been the publicity given the health work by the Press of the Colony, especially *The Gleaner* and *The Times*. These have published the reports of the Co-operative Work and accounts of lectures and public meetings as well as given editorial support. And without the interest of the Superintendent of the Government Printing Office and his staff, the Bureau of Health Education could not have issued its publications, especially *Jamaica Public Health*, in the successful manner in which this has been accomplished.

Mention has already been made of the assistance given by estate owners, but the United Fruit Company, the Jamaica Sugar Estates Ltd., and the Caymanas Estates, Ltd., deserve special mention.

Success in public health work can only be achieved when the people, through their leaders, come to realize the benefits to be derived by the control of preventable diseases. The basis of public health work is education which leads to co-operation; demonstrations in definite problems provide the most effective means of showing what can be done in disease control. Effective demonstration work secures the assistance of leaders who are intelligent and feel a responsibility for the welfare of their communities; through such leaders the co-operation of the people can be assured.

XV.—Conclusion.

During the past fifteen years that the Rockefeller Foundation has co-operated with the Government of Jamaica, there has developed in Jamaica an understanding of the principles of disease prevention which has led to the formation of permanent organized health work directed by trained personnel in every parish. And island-wide problems brought about by tuberculosis, hookworm, malaria and yaws are being met and controlled by special Commissions organized by the Central Government. This education of the people to appreciate the value of good health and to realize the importance of Health Department has resulted in a marked reduction in the sickness and death rates of the Colony which, in turn has led to the provisions of better homes and schools and an improvement in the standard of living of the people.

B. E. Washburn,
Director of the Rockefeller Foundation in Jamaica.